



2050 Northpoint Drive • Suite A • Winston-Salem, NC 27106

Phone: (336) 896-1300 • Fax: (336) 896-1020

e-mail: geosci@geotec.com

July 28, 2000

Ms. Beverly Williams
US EPA
61 Forsyth Street SW
Atlanta, GA 30303

Mail Code: Customer Service Branch, 10th Floor

Dear Ms. Williams:

The purpose of this letter is to transmit reports completed to date under the Winston-Salem, NC, Liberty Street Corridor Brownfields Demonstration Pilot program. Geoscience & Technology, P.A. (GeoSci) is the environmental consulting firm selected for this program, under the guidance of Mr. Derwick Paige, City of Winston-Salem Department of Enterprise Community Development. Mr. Paige asked that copies of completed reports be submitted to you.

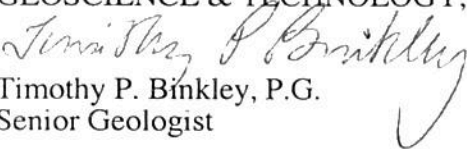
This submittal includes:

1. A Phase I Environmental Site Assessment (ESA) performed on property identified as Forsyth County tax block 3191, lot 004B, 3309 N. Liberty Street. This property lies near the northern end of the Liberty Street Corridor;
2. A Phase I ESA performed on property identified as Forsyth County tax block 0202, lot 101, 863 N. Liberty Street. This property lies near the southern end of the Liberty Street Corridor;
3. An Environmental Research Study on an area identified as the possible future location of the Winston-Sale Airport Business Park. This study area lies just south of Smith-Reynolds Airport, and just east of the Liberty Street Corridor. This Study varies from a Phase I ESA in that it is primarily a research-based report with only reconnaissance-level field inspection. The area contains a large number of individual properties, which were not individually inspected. The report is intended to serve as an overview of the area's history and potential environmental issues related to its development;
4. A Phase I ESA performed on property identified as Forsyth County tax block 313, lots 1, 2A, 2B, 3, 102E, and 102G, formerly 2110 N. Liberty Street. This property lies in the central portion of the Liberty Street Corridor;

Attached Figure 1 illustrates the locations of these properties or study areas.

Thank you for your assistance. Please call if I can be of service.

With best regards,
GEOSCIENCE & TECHNOLOGY, P.A.


Timothy P. Binkley, P.G.
Senior Geologist



Map Source: U.S.G.S. 7.5' topographic quadrangles: Walkertown, NC (1951, photorevised 1986), and Winston-Salem East NC (1950, Revised 1987)

Winston-Salem, NC Liberty Street Corridor Brownfields Pilot Study

Scale:
1" = 2000'

Date:
7/28/00

Title:
Key to Assessment Areas

Job No.:
99.173

Location:
Winston-Salem, NC

Figure No.:
1

Revision No.:
0

**GeoScience &
Technology, P. A.**
"Practical Engineering &
Environmental Solutions"

Winston-Salem, NC (336) 896-1300



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e-mail: geosci@geotec.com

Environmental Site Assessment Phase I

**Forsyth County Tax Block 3191, Lot 004B
Winston Salem, NC
GeoSci Job 00.137**

**Prepared by
Geoscience and Technology, P.A.
For
Becky and Jimmy Flowers
and
The City of Winston-Salem Department
of Enterprise Community Development**

April 2000

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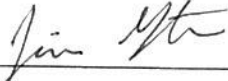
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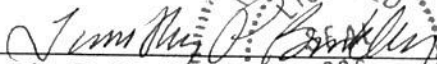
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CERTIFICATION

I hereby certify, this 3rd day of May 2000, that this report was prepared by me or under my direct supervision.



Jim Gorton
Civil/Geotechnical Specialist



Timothy P. Binkley, P.G. 336
Senior Geologist



EXECUTIVE SUMMARY

Geoscience and Technology, P.A. (GeoSci) has completed a Phase I Environmental Site Assessment for the property designated as Forsyth County Tax Block 3191, Lot 004B, currently owned by Becky and Jimmy Flowers. The subject property lies about 200 feet north of the intersection of Fairchild Road and N. Liberty Street (east side of N. Liberty Street), Winston-Salem, NC. The site contains an industrial-type metal frame building that was moved to the site in 1989. No surveys were performed for asbestos-containing materials, lead-based paint, or radon gas.

The purpose of this assessment was to evaluate potential environmental liability by identifying conditions or activities that present existing or potential environmental hazards. The Phase I investigation included site reconnaissance for both natural and induced hazards, an examination of current and historical land use, and a review of state and federal regulatory databases. Information derived from a site walkover and interviews with regulatory officials and the current owner indicated evidence of used oil and solvent storage at the site. Sanborn Fire Insurance maps did not extend to encompass the subject site. The historical City Business directories indicated that the property was undeveloped until 1989. An auto repair and tire supply company inhabited the subject site from 1989-1993. The current tenant operates a similar auto repair business.

Some evidence of uncontrolled or unauthorized storage or releases of waste petroleum products and possibly cleaning chemicals was noted at the subject site. Improper handling of waste fuel products, most notably used oil, was evident at the site. Soil staining, likely associated with these types of materials was identified in several locations. Onsite solid waste observed during the site inspection includes used tires, spare part cars, bottles, cans, wrappers, and an air conditioner casing.

The NC DENR UST Registration List indicated a number of facilities within 0.5 miles of the subject site on which soil and/or groundwater impact has occurred. Three sites with confirmed soil and groundwater contamination by petroleum fuel constituents and/or solvents lie within 0.25 miles of the subject site (Dixie Concrete, Wachovia Oil, Sun Chemical). The solvent sources appear to be largely undefined; their presence on properties on both sides of the subject site suggest that one or more of these incidents pose a potential risk to the subject property.

No facilities appearing on the federal National Priority List (NPL) are located within one mile of the subject site. Several "No Further Action" sites from the CERCLIS list or the State Hazardous Waste Sites list were noted within one mile. No sites were noted on the ERNS listing.

No known permitted solid waste operation lies within 0.50 miles. Anecdotal evidence suggests the possibility that a solid waste landfill once occupied property adjacent to Smith Reynolds airport. One speculated location was near the southwest runway extension, while another was on the northeast side of the airport. However, no specific data has been located to date to verify either the certain presence or location of such a facility.

1.0 INTRODUCTION

Geoscience and Technology, P.A. (GeoSci) has completed a Phase I Environmental Site Assessment, for the property ("subject property" or "subject site") located on the east side of Liberty Street North, approximately 200 feet north of its intersection with Fairchild Road, Winston-Salem, NC (Figure 1).

1.1 Purpose

The purpose of this Environmental Site Assessment (ESA) is to evaluate the potential environmental liability associated with the subject property. The environmental assessment serves to identify conditions or activities at the site and on nearby properties that present existing or potential environmental hazards. The information contained in this report should allow interested parties to determine whether additional investigation or remediation of site conditions is required. The contents of this report should not be construed as a recommendation by GeoSci for or against purchase, sale, financing, or development of the property.

1.2 Scope of Investigation

The ASTM Standard Practice for Environmental Site Assessments (E1527-97) was used to set minimum criteria for data collected during the investigation. The investigation included a site reconnaissance for indications of hazardous materials, chemical and fuel storage, electrical transformers, distressed flora and fauna, ground surface staining, and suspicious odors. It should be noted, however, that this assessment is being performed through The City of Winston-Salem Department of Enterprise Community Development, under a USEPA Brownfields Pilot study grant. The Brownfields program excludes structures and potential environmental concerns arising from them. Therefore, no assessment was performed with regard to radon gas, asbestos-containing-materials (ACMs) or lead-based paint.

The Phase I ESA included research into current and historical land use at the subject site and surrounding area. The research included interviews with site owners, examination of historical aerial photographs and review of City Business directories to identify possible adverse land uses. Reviews were conducted of the federal NPL, RCRA-TSD, CERCLIS, ERNS and Federal Sites lists and the North Carolina SPL, Inactive Hazardous Sites, Hazardous Waste Generators and Groundwater Pollution Incident lists to identify facilities where releases of petroleum products or hazardous substances may have occurred, and sites currently or formerly engaged in solid waste disposal, and hazardous waste generation and handling.

2.0 SITE DESCRIPTION

2.1 Site Location and Designation

The subject property is identified as Tax Block 3191, Lot 004B, on the east side of N. Liberty Street, approximately 200 feet north of its intersection with Fairchild Road. The property is currently owned by Becky and Jimmy Flowers. The current occupant is B&M Auto shop, specializing in automobile engine repair and maintenance. Figure 2 is a site identification map showing the location of the subject site, surrounding properties and zoning classifications. A survey identifying the subject property has not been performed at this time.

Tax block 3191, Lot 004B, according to the Forsyth County tax office, contains ~0.56 acres. Structural improvements to the parcel include a two-story industrial-type metal building, and a concrete parking lot and driveway that encompasses approximately the front third of the site adjacent to Liberty Street North. A portion of the property behind the structure is enclosed by

security fencing. A copy of the Forsyth County tax record for this property, downloaded from the Forsyth County Geo-Data Explorer web site, is included in Appendix A.

2.2 Environmental Setting

2.2.1 Regional and Local Geology

The Winston-Salem area of North Carolina lies in the center of the Piedmont physiographic province of the Southern Appalachian Highlands. The Piedmont is comprised of several northeast trending belts of igneous and metamorphic rock, thought to have been accreted to the eastern edge of North America during the closing of several Paleozoic ocean basins. Winston-Salem lies within the Milton Belt, a terrain dominated by felsic intrusive and metamorphic rocks of early Paleozoic age. According to the geologic map of North Carolina, rocks in the immediate area of the subject site are typically biotite gneiss and schist (Brown et al, 1985). No major structural geologic features are present within the immediate vicinity of the subject site. No outcrops were noted on the subject site.

2.2.2 Topography

The Piedmont is considered by geomorphologists to be an ancient erosional surface developed in the crystalline and metamorphic rock of the region (Thornbury, 1965). Piedmont topography is characterized by gently rolling uplands, commonly forming northeast trending ridges in the western portion of the region. Drainage patterns are typically dendritic and rectilinear, with upland divides everywhere within one mile and often within one-half mile from a stream valley (LeGrand, 1967). Local upland-to-valley relief of a few hundred feet is common.

According to the Walkertown USGS Quadrangle the elevation on the site is approximately 906 feet above sea level. Slope across the lot is generally to the southeast. This slope appears to carry runoff into a south flowing, 30' wide creek that runs adjacent to the eastern property line of the subject site. Water on the west (front) side of the building appears to flow west toward N. Liberty Street.

2.2.3 Regional Hydrogeology

Groundwater in the Piedmont occurs in two hydraulically connected zones, the regolith and the underlying fractured bedrock. Regolith is an unconsolidated or semi-consolidated mixture of weathered rock ranging in size from microscopic clay particles to boulders. It includes the soil zone, saprolite (a clay-rich weathering product often found beneath Piedmont soils), and alluvium (sediments deposited at the surface by water). The thickness of the unsaturated portion of the regolith, i.e., the portion of the regolith above the water table, typically ranges from 5 to 50 feet. Depth to the water table is largely a function of topography: the median water table depth in Piedmont draws and valleys is 20 feet, in slopes and flats 25 feet, and in hills and ridges 32 feet (Harned, 1989). Depth to the water table at a given location varies seasonally, generally declining during the summer when atmospheric conditions favor evaporation and plants transpire large amounts of water, and rising during the winter and spring when precipitation dominates.

Between the regolith zone and deeper, unweathered bedrock lies a transition zone, where intermediate stages of weathering result in a permeable mix of saprolite and boulders. The thickness of the transition zone has been measured in the central Piedmont at 15 feet, but may vary greatly (Harned, 1989). Beneath the transition zone lies crystalline bedrock. Often, the bedrock is fractured, typically as a result of the compressive stresses that deformed the region or from stress-relief related to the removal of overburden. The fractures serve to connect the regolith aquifer, where most of the subsurface storage capacity lies, to the lower-porosity bedrock.

Most of the natural groundwater flow in the Piedmont is confined to the regolith, the transition zone, and the upper 30 feet of bedrock, where the fracture concentration is highest (Harned, 1989). The annual contribution of groundwater to total stream flow is estimated to average 44%. Therefore, groundwater contamination can have a direct impact on streams that may serve as, or discharge to, water supply sources. Subsurface flow is usually toward stream valleys, with the water table surface typically forming a subdued replica of the land surface.

Depth to groundwater and determination of groundwater flow direction is beyond the scope of this investigation.

3.0 NATURAL HAZARDS

3.1 Seismicity

The Piedmont of North Carolina is one of the most seismically quiescent regions in the eastern United States (Figure 3a). Earthquakes are seldom felt in the Piedmont, even though adjacent regions have a long history of frequent low to moderate magnitude events ($M=3-5$). The U. S. Geological Survey has assigned a damage expectancy factor of "minor" to "moderate" for the Piedmont region, based primarily on the occurrence of two destructive earthquakes, the epicenters of which were located several hundred miles away.

The 1886 Charleston, SC earthquake is the largest seismic event ever recorded in the southeastern United States. Shaking from the 1886 Charleston earthquake was felt strongly throughout the Piedmont, with seismic intensity ranging from V to VII and some structural damage reported (Figure 3b). Among the sequence of earthquakes that struck New Madrid, Missouri in 1811-1812 were two of the largest seismic shocks to hit North America in historical times. Shaking from the New Madrid quakes was perceptible as far away as Boston and New Orleans. Nevertheless, damage resulting from this earthquake sequence was minor in the Piedmont, with seismic intensity estimated below VII.

In December 1994, a series of small tremors was felt in Winston-Salem. Although the strongest of the Winston-Salem quakes measured only $M=1.7$, minor structural damage was reported to several private residences. Despite the recent occurrence of small earthquakes in Forsyth and Guilford Counties, seismic events are rare in this region. Given the known seismic history of the Piedmont and surrounding regions, the potential for damage resulting from a large earthquake is considered small. There is no apparent reason to expect that damage at the subject site resulting from regional earthquakes would be greater than similar sites in the region.

3.2 Radon

Radon is a colorless, odorless gas emitted from the natural decay of radioactive elements in the earth's crust. The gas tends to collect in structures that have improperly sealed and poorly ventilated crawl spaces or basements. The occurrence of radon is generally associated with areas underlain by granitic crystalline rocks or phosphatic sands and clays. Figure 4 illustrates the results of a state survey of radon levels measured in over 7,000 North Carolina homes. The average radon concentration measured in Forsyth County homes is below 4.0 picoCuries per liter (pCi/L), the level above which the EPA recommends corrective action. However, radon levels are known to fluctuate greatly in the area, both as a function of radon generation in the subsurface and with the nature of gas pathways to individual buildings. For this reason, the USEPA and the North Carolina Division of Radiation Protection recommend testing of all buildings for radon gas. No radon survey was conducted on this property because the only existing structure is of slab-on-grade construction. Radon assessment, which is excluded from consideration under the Brownfields program, was outside the scope of this assessment.

3.3 Flooding

A March 31, 2000 review of the Federal Emergency Management Association (FEMA) Flood Insurance information provided by the Forsyth County GeoData Explorer web page indicated that the subject site is designated as Zone X, representing an area of minimal flooding potential. Site topography is illustrated on Figure 5.

4.0 HISTORICAL LAND USE

4.1 Ownership History

A cursory chain of title search is typically conducted as a part of a Phase I assessment to determine past ownership history and whether evidence of potentially adverse land uses exists in ownership records. Owner names are chronologically listed in italics below.

The subject site is Tax Block 3191, Lot 004B. Forsyth County tax records indicate that *Becky T. and Jimmy C. Flowers* are the current owners, and have been since July 28, 1995 (book 1866, page 0255). Lot 004 B was owned by *Becky T. Vickers* (Ms. Flowers' maiden name) since its division from a larger block on March 9, 1989 (book 1662, page 2030). Prior to this, Lot 004B had been the southern portion of Tax Block 3191, Lot 004. *Ms. Vickers* owned the continuous Lot 004 since May 9, 1986 (book 1541, page 0784) when she acquired it from *Jack Dempsey Vickers* who had respectively held ownership of the property since May 1, 1986 (book 1539, page 1687). Mr. Vickers acquired the property from *R.B. and Sarah G. Deal*, who had owned the subject property since June 1, 1973 (book 1107, page 0248), when they procured the property from *Wachovia Bank and Trust acting as Trustee of the Winston-Salem Foundation of Winston-Salem, Forsyth County*. The Winston-Salem Foundation acquired the property on December 28, 1953 (book 681, page 0122) from *Richard J. and Murial Reynolds*. Richard J. and Murial Reynolds acquired the property on June 27, 1927 (book 279, page 0122) from the *Virginia Holding Company*, also known as *Virginia Chemical Corporation*.

The subject site appears to be undeveloped until 1989, but research is inconclusive as to whether the Virginia Chemical Corporation utilized the site in an environmentally adverse manner.

4.2 Historical Aerial Photographs

Aerial photographs taken between 1951 and 1997 document changes in land use at and near the subject property during those years. Copies of these photographs were obtained from the Winston-Salem Zoning and Sub-division office. Following are descriptions of noted changes:

1951 (1" = 200'):

The subject site appears partially wooded, with a creek bisecting the northwest corner of the site. No improvements to the subject site are apparent. The adjacent property to the north (tax block 3191 lot 004A) was a contiguous lot with the subject site at that time, and is similarly wooded and undeveloped. Smith Reynolds airport is present to the east of the site. Two structures are apparent on the adjacent property to the south, and appear to match the size and shape of those that presently occupy that lot. A large warehouse-type building is located across Liberty Street (west).

1958 (1" = 200'):

The subject and adjacent sites show little change, but Fairchild Road appears to have been completed.

1966 (1" = 200'):

The subject site remains virtually unchanged, but the formerly undeveloped property to the northwest (across Liberty Street) has been paved and is used as a parking lot. The creek that crosses the subject site is now piped beneath the parking lot property, the outlet of which is on the adjacent property to the north (current tax block 3191 lot 004A). The creek had formerly run along the surface of the parking lot property.

1972 (1" = 200'):

An approximate 20' wide portion of the subject site adjacent to Liberty Street has been cleared. No other changes are apparent.

1978 (1"=400')

Approximately 50 percent of the subject site has been cleared of vegetation and possibly graded. The site does not, however, show visible signs of use.

1984 (1" = 400')

The subject site contains what appears to be a trailer, as well as four vehicles parked in front of it. The adjacent properties remain relatively unchanged. [Note: During an interview conducted for this report, the property owner had been unaware of any structures present on the subject site prior to 1989 when the current structure was installed.]

1987 (1" = 200')

The subject site and adjacent property to the north have been cleared and graded. The creek has been rerouted to the rear of the subject site.

1990 (1"=400')

A building has been installed at the subject site, and appears to match the size and shape of the current structure. A structure has also been built on the adjacent property to the north. No other changes are evident.

1997 (1"=200')

The aerial depicts many cars in the rear of the property, as well as a pile of solid material that roughly correspond to locations of tire piles observed during the site inspection. The adjacent sites have not changed significantly.

Figure 6 is a copy of portions of the 1997 aerial photographs of the subject site and surrounding areas (City of Winston-Salem Department of Zoning and Sub-division Maps #630866 and #636866, March 17, 1997). Of note is the fact that the large warehouse directly across Liberty Street from the subject site has recently been removed, and the property is now regraded and devoid of structures.

4.3 Sanborn Fire Insurance Maps

Sanborn Maps were published between 1895 and 1952 by the Sanborn Fire Insurance Company of New York, identifying potential fire hazards. These documents are on file at the Forsyth County Library. GeoSci reviewed index copies of Sanborn maps in the vicinity of the subject site, and found that the maps did not extend to encompass the subject site. The 1958 Sanborn map appears to extend beyond the subject site, but is of poor quality and is therefore, unreadable. The 1969 Sanborn maps did not extend to encompass the subject site.

4.4 City Business Directories

The purpose of the Business Directory review is to determine if past businesses with the potential for adverse environmental impact were located on or near the subject site. Results are listed below:

1902-1940:

No potentially adverse listings for the 3300 block of N. Liberty Street.

1945:

Piedmont Aviation and Eastern Airlines were listed at 3315 N. Liberty Street, and likely did plane maintenance work. The Forsyth County Board of Education garage was listed at 3300 Liberty Street, and likewise probably performed automotive maintenance work.

1950-1985:

No potentially adverse listings for the 3300 block of N. Liberty Street.

1990:

Liberty Tire and Auto is located at the subject site address: 3305 N. Liberty Street.

1995:

B&M Auto Repair is located at the subject site, and two other automobile service shops (Northside Transmission Center and Buford's Automotive) are located at 3307 N. Liberty, the adjacent property to the north.

5.0 SITE INSPECTION

5.1 Current Use and Conditions

On April 13, 2000, a visual reconnaissance, or site walkover, of the subject property was performed. Photographs taken during the site walkover are presented as Figures 7a-7j.

The western edge of the property is bounded by N. Liberty Street, the northern by a light industrial use property (Tax block 3191, Lot 004A), the eastern edge by a 30 foot wide creek and Smith Reynolds Airport beyond, and the southern edge by Highway Business type properties (currently a restaurant and auto-repair shop).

The front third of the site (westernmost third) is concrete paved and abuts N. Liberty Street. The southern boundary is contiguous with other parking areas on the adjacent lot. The northern margin is bounded by a Duke Power right of way. The property is bounded to the east by an unnamed creek that appears to carry a significant portion of the runoff from the adjacent section of Smith Reynolds Airport, as well as the subject site. A chain link fence encloses approximately the middle third of the property. No storm drain inlets were noted on the subject site.

The only structure on the site is a two-story 120' X 80' industrial-type metal building, that is primarily used as an auto repair shop. Mr. Bernard Eldridge, the manager of the shop, was interviewed during the walkover. He stated that the business generates used oil, and has Safety-Kleen Premium Gold solvent (Naphtha, a.k.a. Mineral Spirits) in drums. A material data safety sheet for this material is included as Appendix B. Three full drums of used oil were noted inside the building, as well as many other containers filled with this material, including uncovered metal pans. According to Mr. Eldridge, Noble Oil Company picks up and disposes of the used oil roughly on a monthly schedule, and was due to pick up the material at the time of the walkover. The Safety-Kleen Gold drum appeared to be in satisfactory condition, and is removed and disposed of by the Archdale branch of the Safety-Kleen Corporation, when necessary. B&M Auto also has an abundant supply of used engine parts stored in various locations throughout the structure. The used parts varied in appearance from relatively clean to extremely dingy.

Two 55-gallon drums are present outside (in the rear of) the building as well. One of the drums was approximately one-third full of a viscous hydrocarbon substance, and is partially uncovered. Evidence of soil staining (~8'X6') was evident in this location. The second drum behind the structure was about half full, and was labeled as hydraulic oil. The drum appeared to be devoid of holes, but soil staining was evident at the base of the drum, extending approximately 10 feet downgradient from the drum. Other evidence of staining was found in the southeast corner of the fenced area. A 5' X 5' area devoid of vegetation and dark in color, was observed at the base of a pile of broken up concrete. Dead vegetation extended beneath the fence and toward the stream at the rear of the site.

Solid waste noted on the subject site included spare part cars, used tires, and various bottles, cans and papers. What appeared to be an air conditioner casing was found on the eastern property line. No transformers or water supply wells were noted on the subject property.

5.2 Above-Ground Chemical And Fuel Storage

On the day of the site walkover, no fuel or chemical above-ground storage tanks (ASTs) other than the containers noted in Section 5.1. No evidence to date has been found to indicate the presence of past ASTs or chemical/fuel storage vessels on the subject site.

5.3 Underground Storage Tanks (USTs)

No underground storage tanks (USTs) were observed on the subject site. Information from previous assessment work in this area, as well as UST registration records, suggests that the subject property has not contained a known UST.

5.4 On-Site Solid Waste

On the date of the site walkover, approximately 3 dozen old tires were observed in various piles throughout the rear portion of the subject site. Used car engine parts, such as transmission appurtenances, were also strewn about the site. Inspection of the interior of the structure revealed spare part storage, primarily an accumulation of used engine parts.

Also noted on the subject property were solid wastes such as paper scraps, bottles and cans, and an air conditioner casing, near the eastern property line. Old cars, possibly used for spare parts, were present throughout the site. These cars number in excess of one dozen.

5.5 On-Site Hazardous Waste

No evidence of commercial or industrial practices was noted on the subject site that would require the handling and/or storage of hazardous waste beyond the use of Safety-Kleen Gold degreaser (Naphtha), and the used oil.

5.6 PCBs

Leaking electrical transformers are a primary source of polychlorinated biphenyl (PCB) contamination. On the date of the site walkover, no electrical transformers were observed on the subject site. A transformer is located across Liberty Street from the subject site, on the City of Winston-Salem property.

5.7 Asbestos

No survey of asbestos containing material (ACMs) was conducted at the subject site because it is beyond the scope of this investigation (see Section 1.2).

5.8 Lead-Based Paint

No survey of lead-based paints was conducted at the subject site because it is beyond the scope of this investigation. The only enclosed structure is a metal industrial-type warehouse that was installed in 1989 (see Section 1.2).

5.9 Surrounding Land Use and Zoning

On April 13, 2000, field reconnaissance was performed to identify surrounding land uses. The surrounding uses are as follows:

North: Industrial Warehouse.

East: Southernmost portion of Smith Reynolds Airport.

South: Restaurant/Bar, Automotive repair facility beyond.

West: Liberty Street North, graded lot (formerly utilized by Dixie concrete).

According to the Forsyth County Zoning and Sub-division Office, the subject property is zoned GI, general industrial (previously referenced Figure 2). Permitted uses include a wide range of assembling, manufacturing, and fabricating activities. The purpose of this district is to designate appropriate locations and establish development regulations for uses which may have significant environmental impacts.

6.0 REGULATORY REVIEW

A review of regulatory information was performed to identify facilities currently engaged in solid waste disposal, hazardous waste generation and handling, underground storage tank operations, and incidents involving releases of petroleum products, hazardous and toxic materials. This review included UST registration and groundwater incident lists, federal NPL sites list, RCRA-TSD facilities list, CERCLIS, the North Carolina SPL list, and Hazardous Waste Generators database, and the Emergency Response Notification System (ERNS) list.

6.1 Underground Storage Tanks (USTs)

Table 1 lists sites within 0.25 mile of the subject site with registered (USTs) per the NC DENR UST registration list, on file at the Winston-Salem Regional Office; Table 2 lists sites within 0.50 miles appearing on the NC DENR Groundwater Pollution Incident list:

Table 1: Summary of UST Registrations	
Site Name and Address	UST Sizes (gal.)
Norfolk & Western Rail, 600 Gaynor Rd.	1-1,000 gasoline
Winston-Salem Office, 3300 N. Liberty St.	1-8,000 gasoline; 1-8000 diesel; 1-1,000 gal waste oil
Forsyth County Garage, 1202 Fairchild Rd.	1-12,000 gasoline; 1-12,000 diesel; 3-10,000 gasoline (removed); 1-500 used oil (removed); 1-1000 motor oil (removed)
Wachovia Oil, 1095 Fairchild Rd.	2-20,000 diesel (removed); 1-20,000 kerosene (removed); 1-8,000 gasoline (removed)
Sun Chemical Corp., 1100 Fairchild Rd.	18 tanks ranging from 2,000 to 11,500 gal.: acetate prod., VM&P, SANT141, NPA, MEK, Toluene, DBP, Kerosene, Resin Sol., Ethanol.

Table 2: Summary of Groundwater Incident List Sites			
Incident #	Site Name and Location	Incident Code	Hydrologic Position/Direction/Distance
5006	Dixie Concrete Company, 3300 N. Liberty Street	4, U	Lateral/upgradient, WSW, 400'
10315	Wachovia Oil Bulk Plant, 1095 Fairchild Road	4	Downgradient, WSW, 800'
18074	Sun Chemical Specialty Inks, 1100 Fairchild Rd	4	Downgradient, SW, 1000'
16467	Sun Chemical Specialty Inks, 1100 Fairchild Rd	2	Downgradient, SW, 1000'
12288	Forsyth County Garage, 1202 Fairchild Rd	4	Downgradient, SW, 1100'
11294	Norfolk & Western Rail-Gaynor, 600 Gaynor St.	4	Upgradient, NE, 1300'
5010	Davco Corp., 3001 N. Liberty Street	5	Upgradient, S 1500'
10312	Norfolk & Western Rail, 3000 N. Liberty St.	3	Upgradient, S, 1500'
5842	Hertz Rental, 3741 N Liberty St.	4	Upgradient, NNE, 1600'
17760	Lowe's Liberty Street, 3750 N. Liberty St.	3	Upgradient, N, 1600'
10022	Airport Exxon, 3751 N. Liberty St.	4	Upgradient, NNE, 1700'
12737	Piedmont Aviation, 3821 N. Liberty St.	3	Upgradient, NNE, 1800'
12695	Piedmont Aviation Serv. Reg A, 3821 N. Liberty St.	3	Upgradient, NNE, 1800'
15529	Frozen Food Portion Pack, 3535 Glenn Ave.	4	Upgradient, NW, 2200'
18434	Piedmont Coachlines, 3636 N. Glenn Ave.	4	Upgradient, NW, 2300'
9919	Ilco-Unican C, 2941 Indiana Ave.	4	Upgradient, SW, 2500'

Notes on hydrologic position:

Downgradient: Sites at locations where groundwater flow appears to be away from the subject site.

Lateral: Sites at similar elevations, but with low potential for groundwater flow toward the subject site.

Upgradient: Sites at locations where groundwater flow toward the subject site is possible or likely.

Notes on incident codes:

1. Notice of Intent to close UST(s).
2. Report(s) recorded but unclassified pending review.
3. Confirmed soil contamination.
4. Confirmed groundwater contamination.
5. Confirmed soil contamination, remediated and closed.
6. Non-incident closure.

Several sites greater than 0.25 miles from the subject site have been impacted by releases of petroleum fuels, solvents, or metals. Three sites within 0.25 miles of the subject property, on which releases have been documented, are described below (in order of distance from subject site):

Dixie Concrete Company

At its nearest point, the Dixie Concrete Company lies no more than 75 feet from the subject site (southwest, across N. Liberty Street, and possibly upgradient). Soil contamination was discovered on this property on April 15, 1989, during an Environmental Site Assessment. The USTs were subsequently removed, and a soil sample collected during UST Closure contained high concentrations of benzene, toluene, xylenes, and acetone. Benzene, toluene, xylenes, and, to a lesser extent, 1,2-dichloroethane, are consistent with a leaking gasoline UST, but the acetone is typically not reported as a gasoline constituent. A source for the acetone has not been specifically identified. The NC DENR file contained a tank file activity sheet indicating that a Limited Site Assessment (LSA) was requested on May 21, 1999. No such report was noted in the file. A January 1991 report map indicated a groundwater flow direction to the east-southeast, likely just south of the subject site. However, this site's proximity and uncertain source for acetone suggests the Dixie Concrete facility could represent an environmental risk to the subject property.

Wachovia Oil

The Wachovia Oil Bulk Plant site is located downgradient from the subject site (about 550 feet at its closest point). Several underground storage tanks, including two 20,000 gallon diesel USTs, a 20,000 gallon kerosene UST, and an 8,000 gallon gasoline UST were removed on July 12, 1992. Free product was discovered in the excavation at the time of removal. The site also contained a 1 million gallon bulk oil AST until the mid-1990's. Groundwater samples from monitoring wells on this site indicated impact by both petroleum fuel products and chlorinated solvents. Although the source for the solvent compounds has not been identified, a DENR file memorandum, dated July 30, 1998, suggests that the source for the solvents is either upgradient or cross-gradient, rather than on the subject property. The memo further suggests the possibility of solvent impact from an unregistered landfill that "allegedly occupied the site," rather than from subsequent onsite business activities. The site was assigned "No Further Action" status in a July 26, 1999 letter from the UST Section. In terms of regolith impact, this site appears to pose little risk to the subject site, based on a lower topographic position (and inferred downgradient hydrologic position), reported southward groundwater flow, and the fact that this site may be hydrologically separated by a stream between the two sites. It is unknown whether bedrock impact from this facility exists offsite.

Sun Chemical Company

The Sun Chemical Specialty Inks site (a.k.a. Thiele-Engdahl Inc.), lies downgradient. It is about 800 feet to the portion of the property where 17 USTs were formerly located. The site underwent a CERCLA Site Screening Investigation in 1988. Soil samples from this assessment contained phthalate compounds; surface water samples from Brushy Fork Creek, which borders the site to the south, contained several semi-volatile organic compounds, which generally declined in concentration with distance from the site.

Documented releases have occurred at this facility since 1990, including isopropyl acetate, toluene, dibutyl phthalate, and intermediate ink product (containing n-propyl acetate, isopropyl acetate, toluene, and dibutyl phthalate). A total of 18 USTs have been documented at this facility. A heating oil UST was removed (clean closure) in 1992. Six USTs were removed in 1996, and groundwater was encountered above the base of the tanks. A groundwater sample from the UST excavation contained a number of solvents and by-products, chief among them acetone, reported at 1600 ppb and bis(2-ethylhexyl) phthalate at 1650 ppb. Eleven USTs were closed in 1998. A

March 2000 Comprehensive Site Assessment (CSA) indicates that 11 groundwater monitoring wells have been installed. A February 1997 analytical summary indicated a number of compounds were detected, including high concentrations of toluene (as much as 319,000 ppb in one monitoring well). Several chlorinated solvents were also detected. The February 2000 CSA contended that the solvents were sourced offsite. Two AFVR events were performed in 1997, resulting in the removal of more than 1700 gallons of impacted groundwater.

The site's proximity to Brushy Fork Creek suggest southward groundwater flow. Like the Wachovia Oil site, this site appears to be hydrologically separated from the subject site in the regolith. However, the presence of a large suite of compounds, including some that have been noted on other surrounding sites, suggests that this site could pose a risk to the bedrock aquifer underlying the surrounding area.

Conclusive source definition has apparently not been achieved at these sites with regard to solvents, and a number of recalcitrant compounds have been reported. In terms of topographic position, the Dixie Concrete site appears to pose the greatest potential risk to the subject property. However, the presence of solvents at all three sites suggest a variety of sources from industrial activities in the area, either current or prior, some of which could pose a risk to the subject site. Appendix C contains excerpts from NC DENR Incident Files regarding the above-referenced sites.

6.2 Solid Waste

On March 31, 2000, in a telephone conversation, Mr. Hugh Jernigan, of the North Carolina Division of Solid Waste Management, indicated that no permitted solid waste disposal facilities are located within 0.50 mile of the subject site. As has been previously noted, anecdotal evidence suggests the possibility that a landfill once existed between the subject site and the southern extent of the southwestern runway at Smith Reynolds Airport. To date, specific information about either the fact or the location of such a facility has not been noted. If present, such a facility could contribute to degradation of environmental quality on adjacent properties.

6.3 Hazardous Waste

On March 31, 2000, in a telephone conversation, Mr. Steve Phibbs, Hazardous Waste Specialist in the Winston-Salem Regional Office of the North Carolina Division of Hazardous Waste Management, said he was unaware of uncontrolled or unauthorized releases of hazardous waste having been reported for the subject site.

One RCRA generator, Sun Chemical (a.k.a. Thiele-Engdahl) is located within 0.25 miles of the subject site (per the RCRA Notifier's List). This site is discussed in Section 6.1.

The IMC Rainbow Winston-Salem site, located at 3105 Glenn Avenue, was the only site within one mile on the RCRA permitted or interim status facility list (sites under assessment or remediation under the Resource Conservation and Recovery Act (RCRA). Research indicated that an assessment has been completed and the site has been ranked as intermediate priority. The IMC site is located approximately 2,600 feet from the subject site.

Three sites within one mile appeared on the federal CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System) sites list and/or the Inactive Hazardous Sites Inventory. These are identified in Table 3:

Table 3: Summary of CERCLIS and Inactive Sites Inventory Facilities			
Facility	Location	Status	Direction/Distance
Thiele- Engdahl Inc.	1100 Fairchild Rd	No Further Action	Lateral, 800'
Stewart-Warner Corp-Bassick	2941 Indiana Ave.	No Further Action	Upgradient, 2600'
IMC Rainbow Winston-Salem	3105 Glenn Ave. Ext.	No Further Action	Upgradient, 2800'

The Thiele-Engdahl Site appears on both the RCRA generators and CERCLIS lists. This site is now operated by Sun Chemical, which has had apparent releases from USTs and other site operational areas. Although a "No Further Action" status has been assigned with regard to the CERCLIS program, the submittal of a CSA in February 2000 indicates that the site is still being assessed under other regulatory programs. See Section 6.1 for a description of assessment results for this site.

The Stewart-Warner site is listed because buried drums of cyanide and organics were found during removal of a fuel UST. The IMC fertilizer site groundwater sample analyses revealed metals and inorganics. Both are classified as No Further Action sites, and both appear to pose little risk to the subject site based on relative position and distance. It is unknown whether assessment or remedial action is proceeding at either site under other regulatory programs.

No facilities appearing on the federal National Priority List (NPL) were noted within one mile of the subject site. Two facilities within one mile of the subject site appear on the State Hazardous Waste Sites (SHWS) list. The Thiele-Engdahl site on Fairchild Road, and the Stewart-Warner site (discussed above) both appear on the SHWS list. The ERNS list (Emergency Response Notification List) identifies no adjacent sites on which spills requiring potential emergency response have occurred.

6.4 Local Fire Marshal

GeoSci faxed to Ms. Jeannene Kirkland, Computer Information Analyst at the Winston-Salem Fire Department, an inquiry regarding records on file indicating fires or uncontrolled surface releases of fuel products or chemicals near the subject site. There were two instances of released substances, one of which occurred on the adjacent property. On May 2, 2000, GeoSci called the Fire Marshal for a further description of these releases. As of this writing, such information has not been received. On May 3, 2000, GeoSci received a fax from the Fire Marshal's office indicating no additional information was available for these incidents. Therefore, the precise locations and impacts of these releases are unknown. Their absence on the ERNS list suggests that emergency response was not required.

7.0 SUMMARY

GeoSci has completed an Environmental Site Assessment, Phase I for the property identified as tax block 3191, lot 004B, Winston-Salem, NC.

The only onsite structure is an industrial-type metal building, which is currently utilized by an auto repair facility. No surveys were performed for asbestos-containing materials, lead-based paint, or radon gas, per the Brownfields program exclusion of structurally-related materials.

Some evidence of uncontrolled or unauthorized storage or releases of waste petroleum products and possibly cleaning chemicals was noted at the subject site. Improper handling of waste fuel products, most notably used oil, was evident at the site. Soil staining, likely associated with these types of materials was identified in several locations. Observed onsite solid waste includes used tires, spare part cars, bottles, cans, wrappers, and an air conditioner casing.

A review of historical aerial photographs indicates that there was no structure present on the subject property from 1951 to 1984. A trailer was present on the site in 1984, but was removed prior to the 1987 aerial. The existing structure was depicted at the subject site on the 1990 aerial photo.

The NC DENR UST Registration List indicated a several facilities within 0.25 mile with registered USTs and within 0.50 miles on which incidents have been filed with NC DENR. Three sites with confirmed soil and groundwater contamination by petroleum fuel constituents and/or solvents lie within 0.25 miles of the subject site (Dixie Concrete, Wachovia Oil, Sun Chemical). The solvent

sources appear to be largely undefined; their presence on properties on both sides of the subject site suggests that one or more of these incidents pose a potential risk to the subject property.

No facilities appearing on the federal National Priority List (NPL) are located within one mile of the subject site. Several "No Further Action" sites from the CERCLIS list or the State Hazardous Waste Sites list were noted within one mile. There were no sites noted on the ERNS listing.

No known permitted solid waste operation lies within 0.50 miles. Anecdotal evidence suggests the possibility that a solid waste landfill once occupied property adjacent to Smith Reynolds airport. One speculated location was near the southwest runway extension, while another was on the northeast side of the airport. However, no specific data has been located to date to verify either the certain presence or location of such a facility.

The possibility of onsite sources from past or previous activities and a number of potential offsite sources suggest that further assessment is warranted for this site.

8.0 LIMITATIONS OF THE INVESTIGATION

This Environmental Site Assessment was developed in general accordance with national standards for good commercial and customary practice as defined by the American Society for Testing and Materials. It should be noted, however, that this assessment is being performed through The City of Winston-Salem Department of Enterprise Community Development, under a USEPA Brownfields Pilot study grant. The Brownfields program excludes structures and potential environmental concerns arising from them. Therefore, no assessment was performed with regard to radon gas, asbestos-containing-materials (ACMs) or lead-based paint. Exclusion from the Brownfields program does not, however, excluded these materials from consideration with regard to the site's environmental quality. Health, safety, and environmental quality issues related to these materials should be pursued as a part a comprehensive assessment of site conditions, independent of this investigation.

This assessment is based on information provided by municipal, state and federal agencies, from aerial photography, from on-site observations, from interviews with property owners and with regulatory personnel. In preparing this report, GeoSci may have reviewed and interpreted information provided to it by third parties, including government agencies, testing laboratories, and other private entities. GeoSci did not conduct an independent evaluation of the accuracy or completeness of all such information.

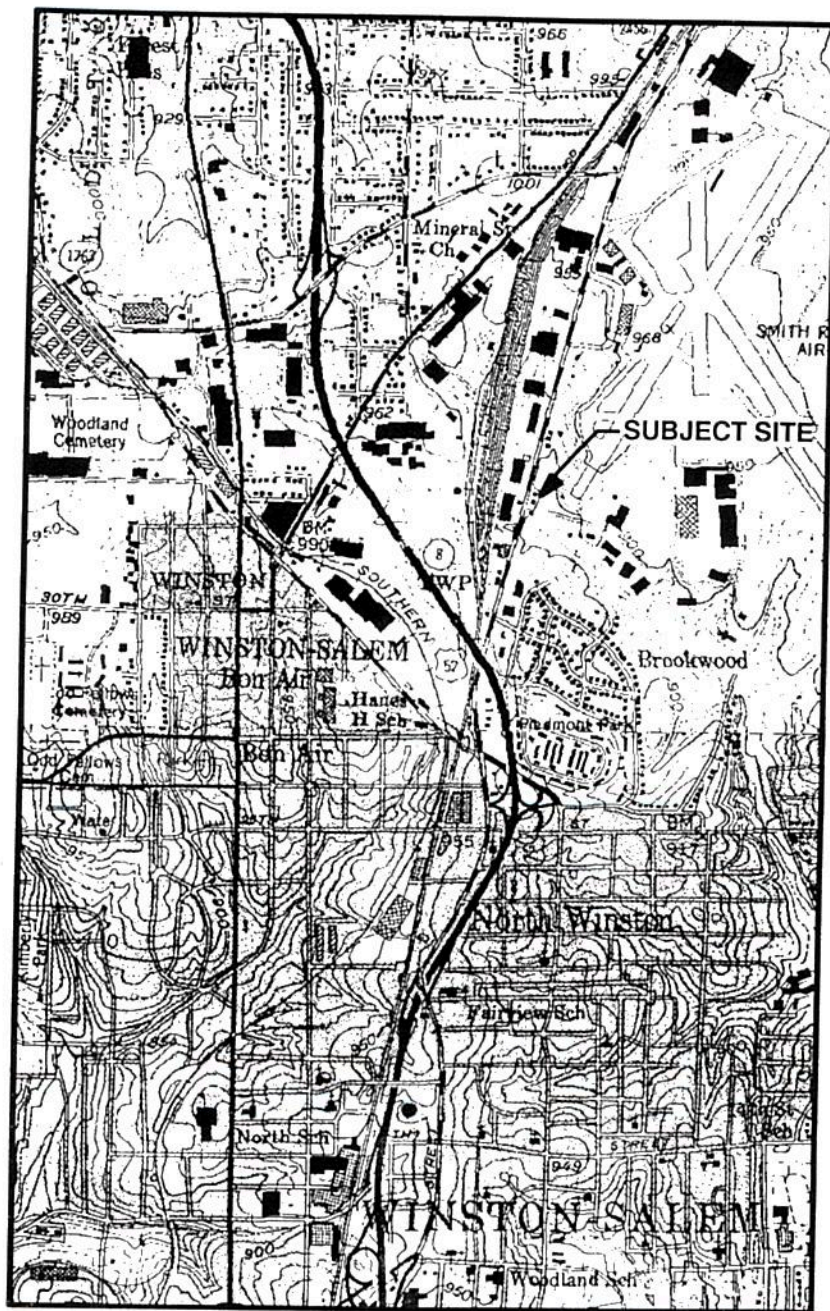
Due to the limited nature of the investigation, GeoSci cannot warrant that all areas within the subject site are of the same quality as that inferred from conditions observed at the surface, nor that future conditions (i.e., after the period in which the assessment was performed) will remain the same as those observed during the performance of this assessment. In the event environmental sampling is performed, either by GeoSci or by others, we reserve the right to revise our opinion as to the presence and scope of environmental hazards at the subject sites. In addition, documents pertaining to the investigation may not have been available at the time of the writing of this report. GeoSci reserves the right to revise its opinion as to the presence of environmental hazards upon review of any additional information obtained. Conditions noted at the site represent observations for April 13, 2000; the data review portion of the assessment is restricted to the regulatory lists and databases available as of the noted review dates.

This report was prepared for the sole use of Mrs. and Mr. Becky Flowers, and The City of Winston-Salem Department of Enterprise Community Development, under a USEPA Brownfields Pilot study grant. Use of the report or data from this assessment by other third parties is at their sole risk; GeoSci disclaims any liability for such third party use or reliance.

9.0 REFERENCES

- American Society for Testing and Materials, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, E1527-93, 1993.
- Amick D. and P. Talwani, Earthquake recurrence rates and probability estimates for the occurrence of significant seismic activity in the Charleston area: the next 100 years, Third US Conference on Earthquake Engineering, v.1, p. 55, 1986.
- Bollinger, G. A., Reinterpretation of intensity data for the 1886 Charleston, SC earthquake, US Geological Survey Professional Paper 1028, p. 17, 1977.
- Forsyth County Geo-Data Explorer web site (tax records), May 2000.
- Harned, D. A., The hydrogeologic framework and a reconnaissance of ground-water quality in the Piedmont province of North Carolina, US Geological Survey Water Resources Investigation Report 88-4130, 1989.
- Hopper, M. G., Estimation of earthquake effects associated with large earthquakes in the New Madrid seismic zone, U. S., Geological Survey Open-File Report 85-457, 1985.
- Johnston, A. C. and S. J. Nava, Recurrence rates and probability estimates for the New Madrid Fault Zone, Journal of Geophysical Research, v. 90, p. 6737, 1985.
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- North Carolina Department of Radiation Protection, Radon in North Carolina (map), 1991.
- North Carolina Department of Natural Resources, Geological Map of North Carolina (map scale 1:500,000), 1985.
- Thornbury, W. D., Regional Geomorphology of the United States, Wiley, New York, 609 p., 1965.
- Winston-Salem/Forsyth County Zoning and Planning Board (aerial photographs), 1999-2000.

FIGURES



Title:
Site Location Map
Walkertown, NC
USGS Quadrangle
Dated 1951, Revised 1986

Project: Flowers ESA
Phase I

Scale:
1" = 2000'

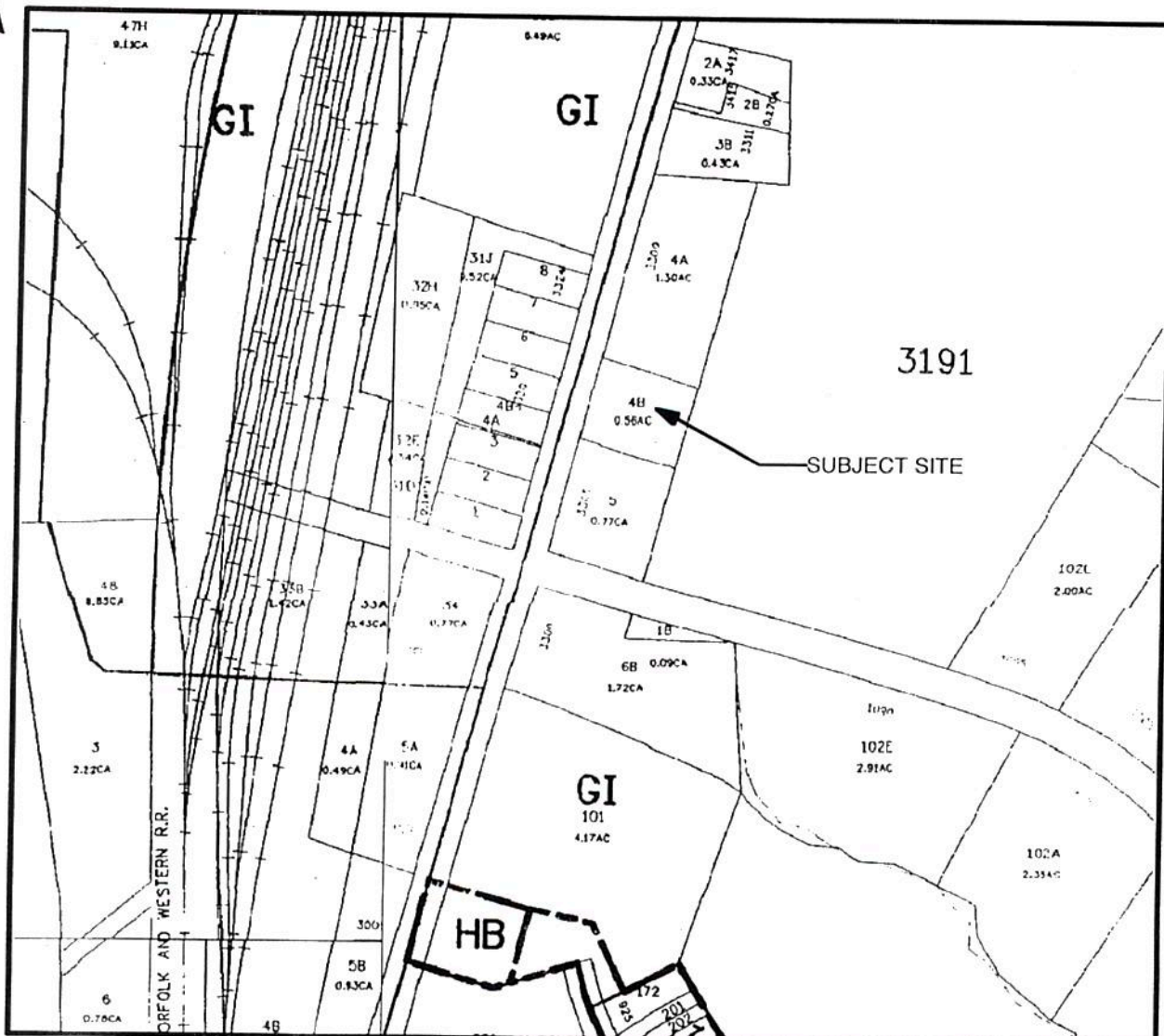
Date:
4/14/00

Job No.: 00.137
Location: Winston-Salem, NC

Figure No.: 1
Revision No.: 0

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Winston-Salem, NC (336) 896-1300



Title:
Site Identification Map
 Winston-Salem Zoning Map
 Tax Block 3191 Lot 004B
 Maps #630866 & 636866

Project: Flowers ESA
 Phase I

Scale:
 1" = 300'

Date:
 4/14/00

Job No.:
 00.137

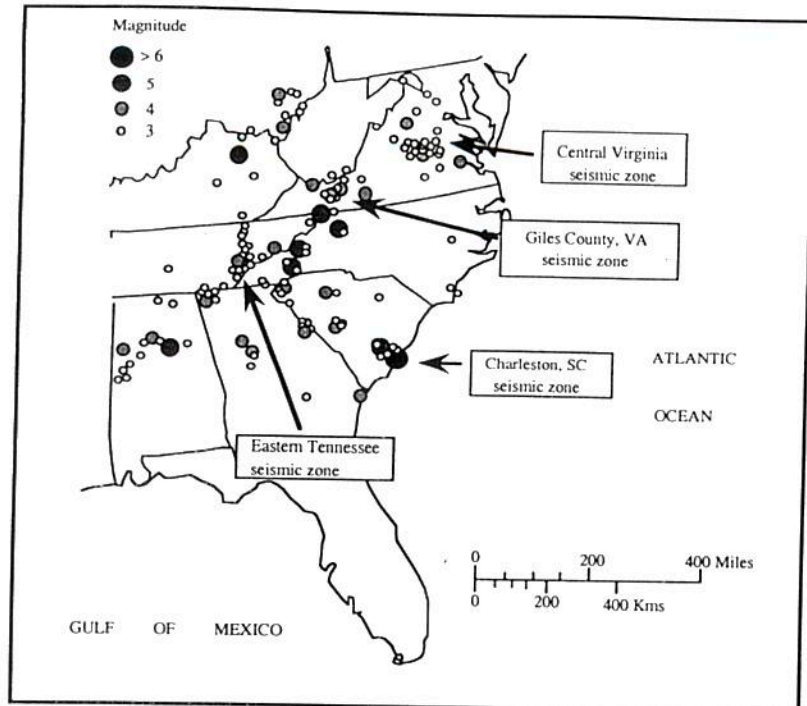
Location:
 Winston-Salem,
 North Carolina

Figure No.:
 2

Revision No.:
 0

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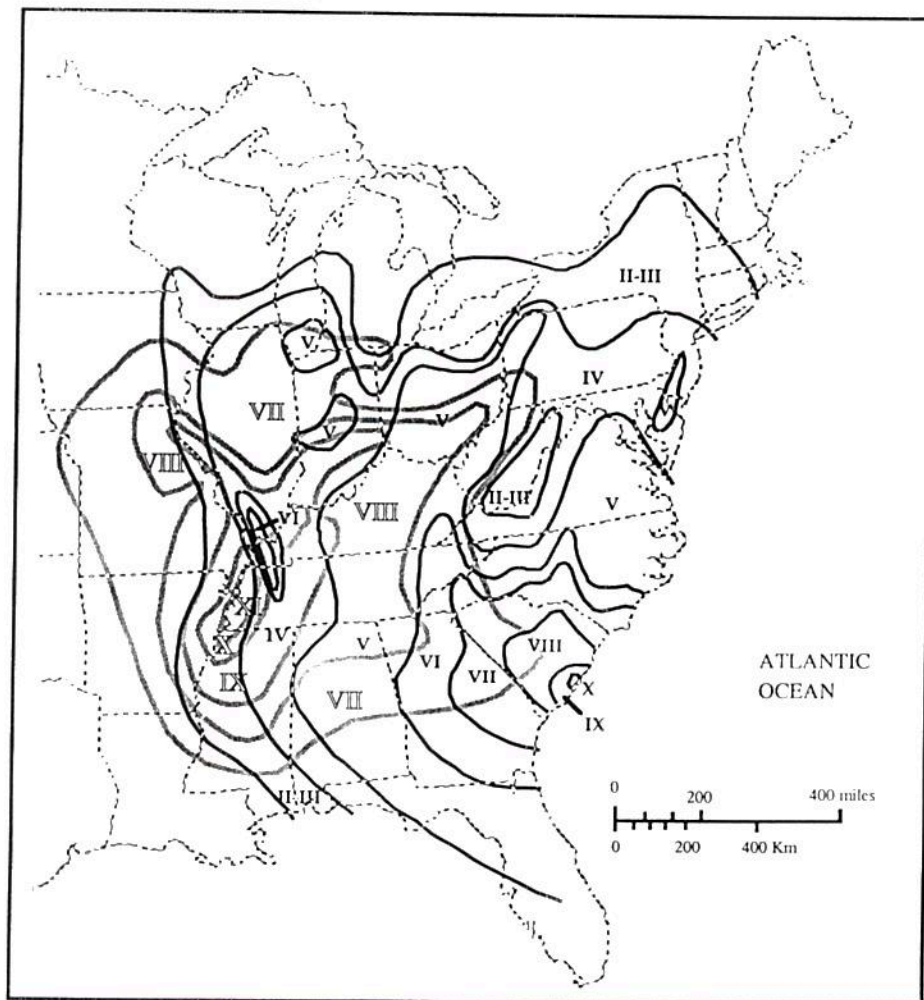
Winston-Salem, NC (336) 896-1300



Seismicity of the Southeast United States 1568 - 1987

Seismicity of the southeastern U. S. showing earthquakes of magnitude 3 or greater that occurred between 1568 and 1987 (modified from Bollinger, 1990). Small to moderate-sized earthquakes are common within the Blue Ridge and Valley and Ridge provinces of the southern Appalachian Mountains and in the coastal plain of South Carolina. Earthquakes in the Piedmont of North Carolina are rare.

GeoScience & Technology, P.A. <i>"Practical Environmental Solutions"</i>	Seismicity of the Southeastern U.S.	
	Flowers Phase I	
From G.A. Bollinger, Virginia Polytechnic Institute, 1990	00.137	
	Figure 3a	



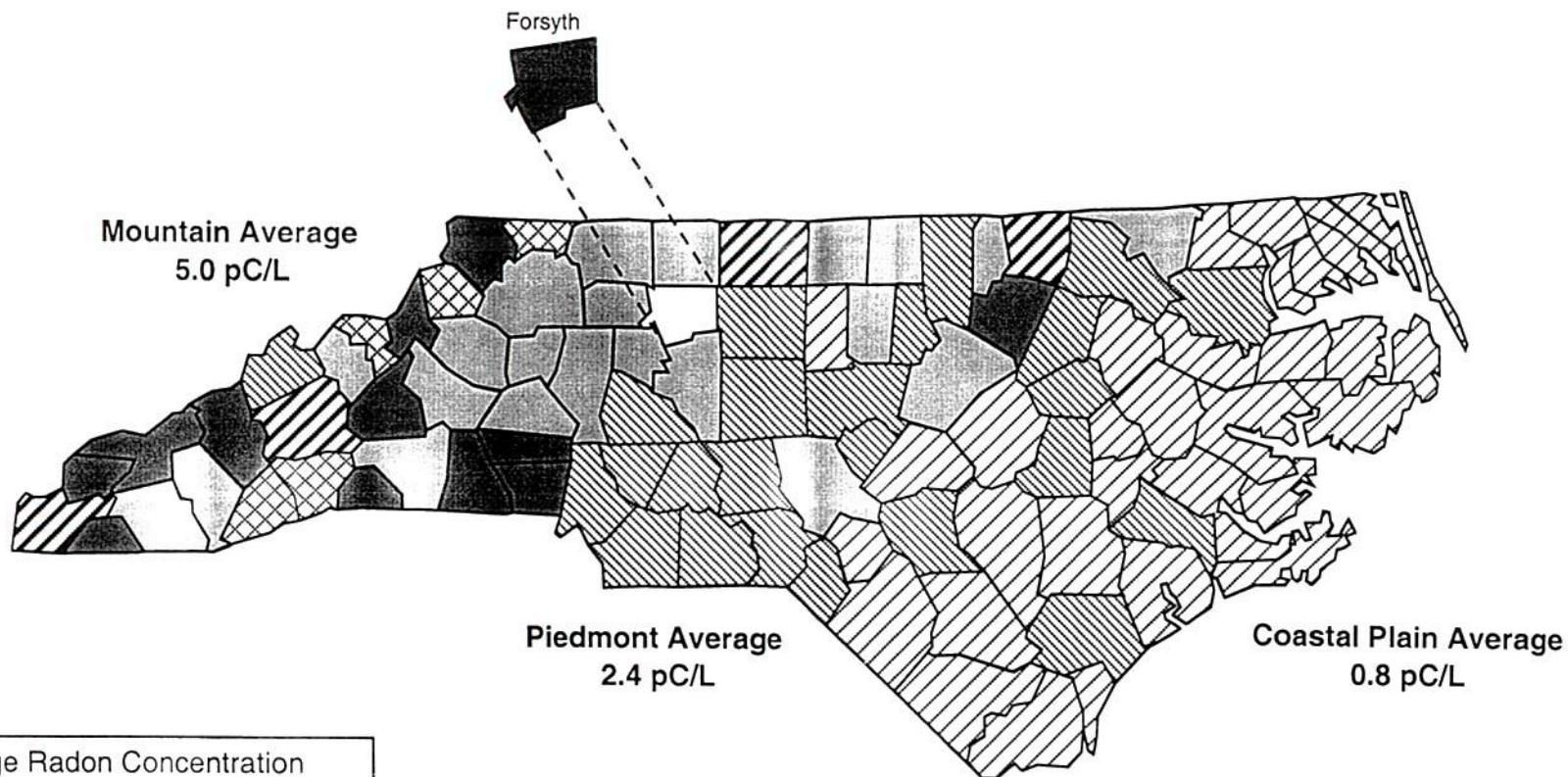
Isoseismals of the 1886 Charleston and 1811-1812 New Madrid Earthquakes

Intensity of shaking in the eastern US resulting from two great historical earthquakes is shown with isoseismals, contours of equal seismic intensity (modified from Bollinger, 1977 and Hopper, 1985). Solid lines and black Roman numerals define the shaking pattern of the 1886 Charleston earthquake; gray lines and white numerals define the pattern of the largest 1811 New Madrid event. Seismic intensity ranges from X-XI (most masonry and frame structures destroyed, general panic) in epicentral areas to II-III (felt only by persons at rest, vibration like passing of a light truck) at great distance. The strongest shaking in the Piedmont was VI-VII (felt by all, furniture moved, some damage to masonry) resulting from the 1886 Charleston, SC earthquake. The probability of a great earthquake recurring in the next 50 years in the southeastern US has been estimated at less than 5% (Johnston and Nava, 1985; Amick and Talwani, 1986).







GeoScience & Technology, P.A. <i>"Practical Environmental Solutions"</i>	Isoseismals of Great Eastern U.S. Earthquakes	
	Flowers Phase I	
From Bollinger, 1977 and Rankin, 1977	00.137	
	Figure 3b	

RADON LEVELS IN NORTH CAROLINA

7,025 Homes - Non Statistical



Average Radon Concentration

-  0 - 1 picoCuries per Liter
-  1 - 2 picoCuries per Liter
-  2 - 3 picoCuries per Liter
-  3 - 4 picoCuries per Liter
-  4 - 6 picoCuries per Liter
-  > 6 picoCuries per Liter

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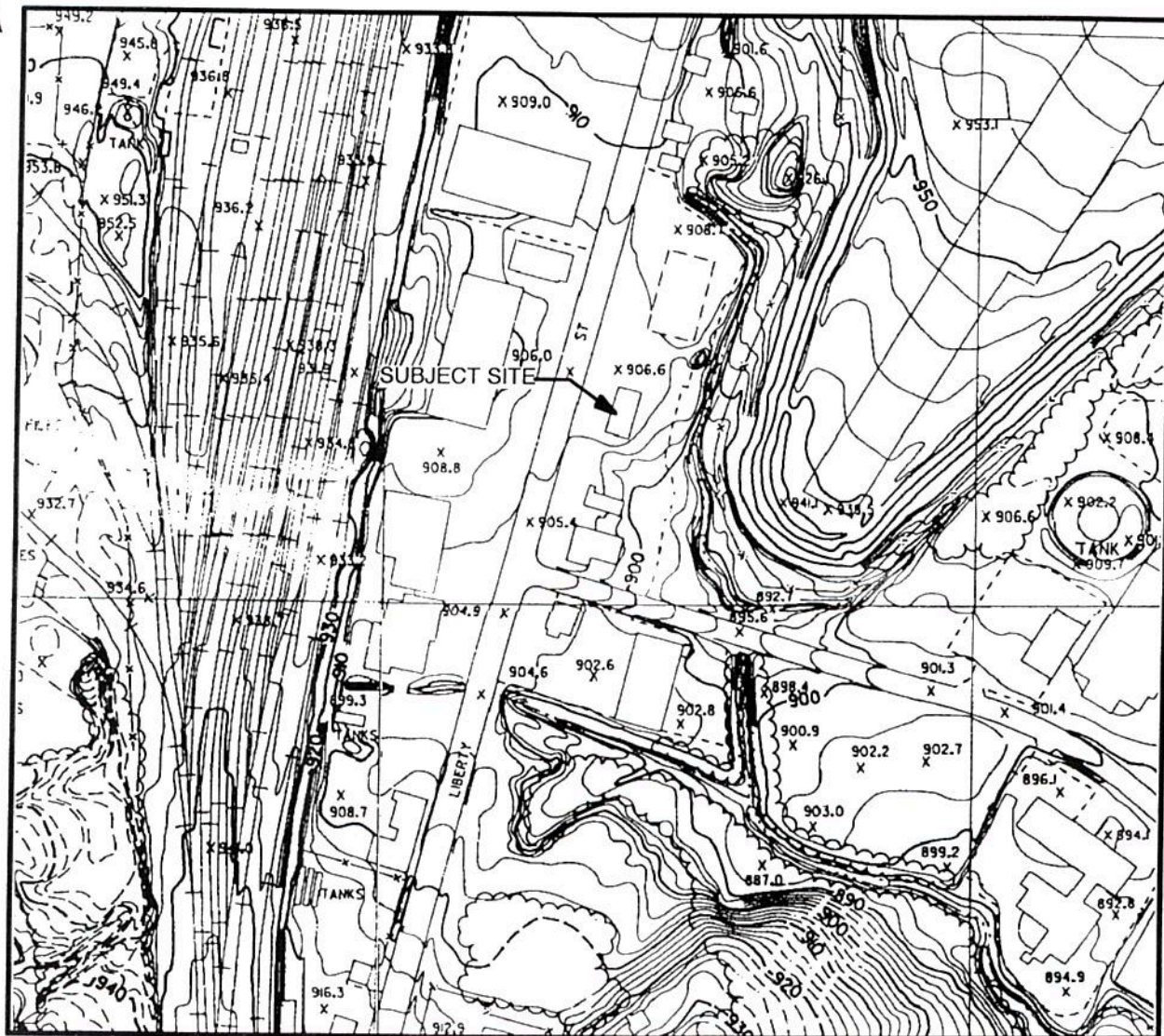
Radon Levels in North Carolina

Flowers
Phase I

From 1992 NC Division of Radiation Protection
compilation of data supplied by vendors,
research organizations and private citizens.

00.137

Figure 4



Title:

Site Topography Map
Maps 630866 & 636866

Project:

Flowers ESA
Phase I

Scale:

1" = 300'

Date:

4/14/00

Job No.:

00.137

Location:

Winston-Salem,
North Carolina

Figure No.:

5

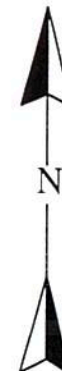
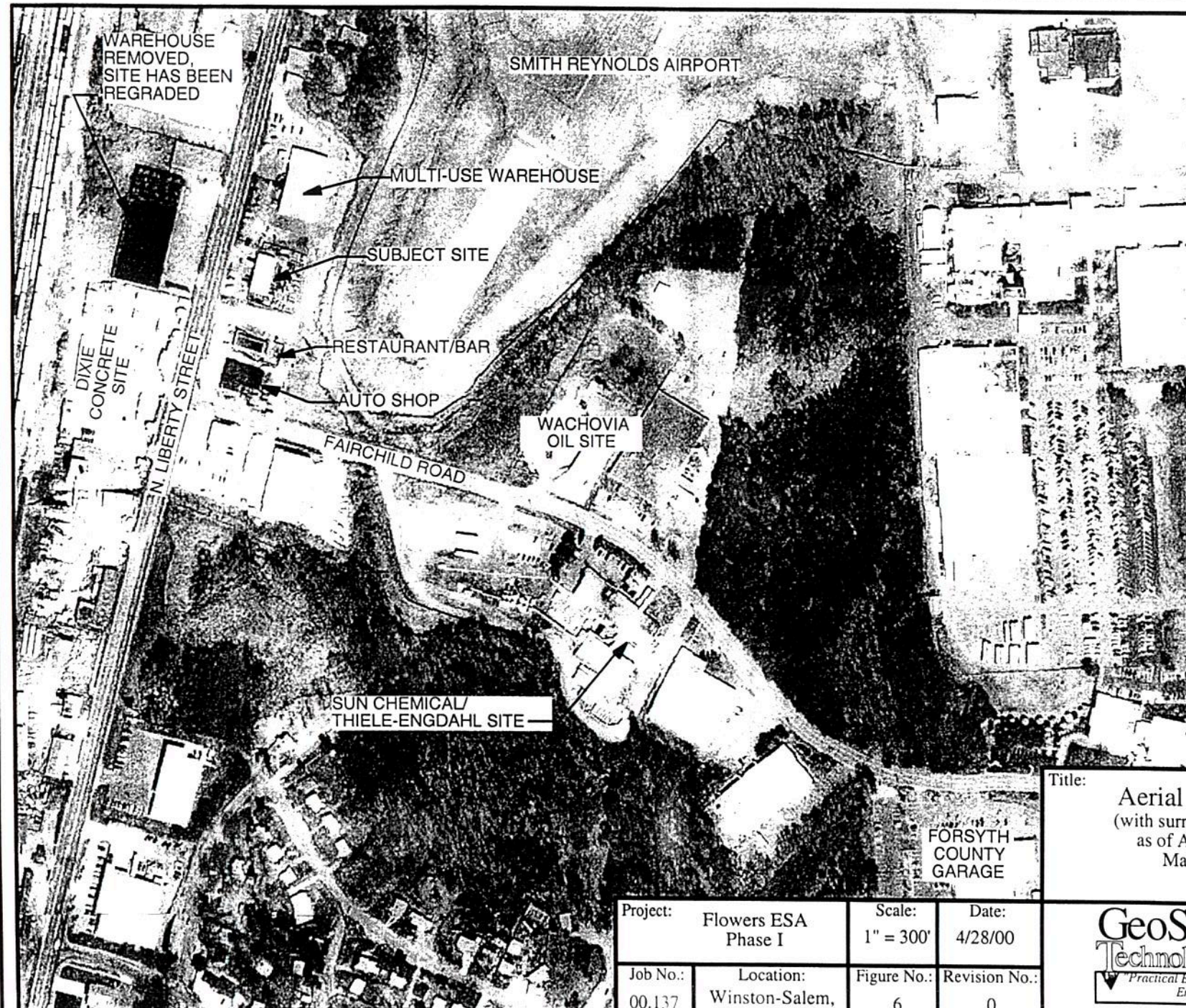
Revision No.:

0

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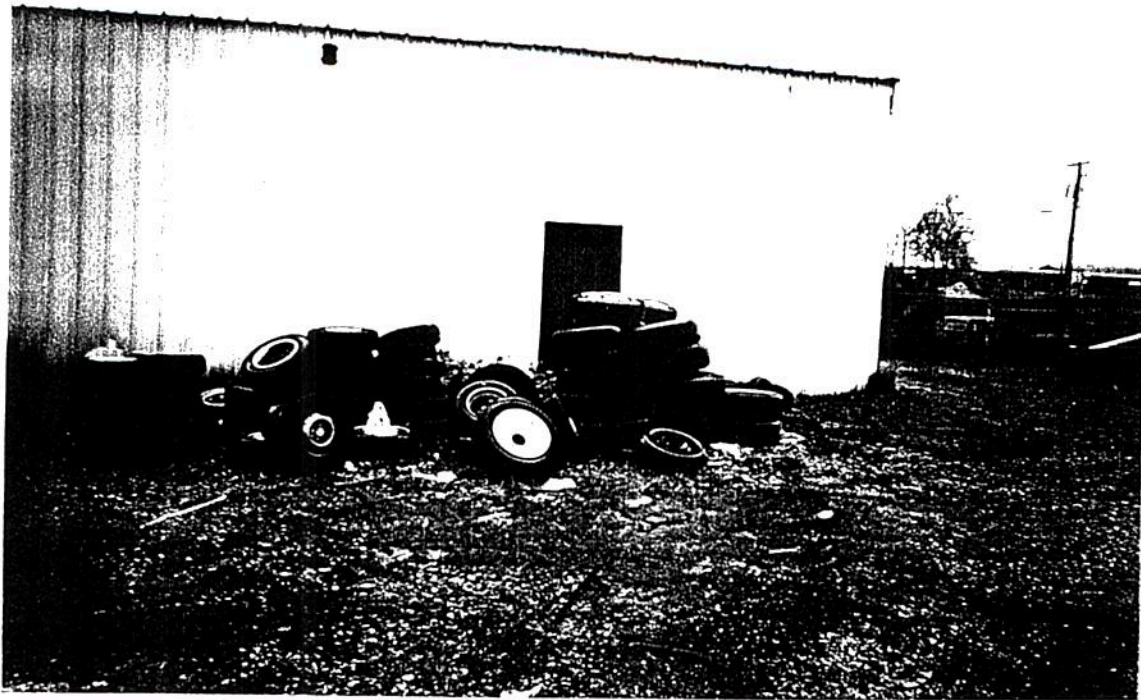


Title:
Aerial Photograph
(with surrounding land use
as of April 13, 2000)
Map #636866

Project:	Flowers ESA Phase I	Scale:	1" = 300'	Date:	4/28/00
Job No.:	00.137	Location:	Winston-Salem, North Carolina	Figure No.:	6
				Revision No.:	0

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Winston-Salem, NC (336)
896 1300



7a: View looking west of used tires stored behind structure.



7b: Spare part/unused vehicles behind structure.

Title: Site Photographs	Project: Flowers ESA Phase I		Scale: Not to Scale	Date: 4/27/00	
	Job No. : 00.137	Location: Winston-Salem NC	Figure No.: 7a-7b	Revision No.: 0	



7c: 55 gallon Drum (1/3 full of oily substance) and associated soil staining.



7d: Hydraulic oil drum and associated soil staining.

File: Site Photographs	Project	Flowers ESA Phase I	Scale: Not to Scale	Date: 4/27/00	
	Job No	Location:	Figure No	Revision No	
	00137	Winston-Salem NC	7c-7d	0	



7e: Soil staining in the southwest corner of fenced area.

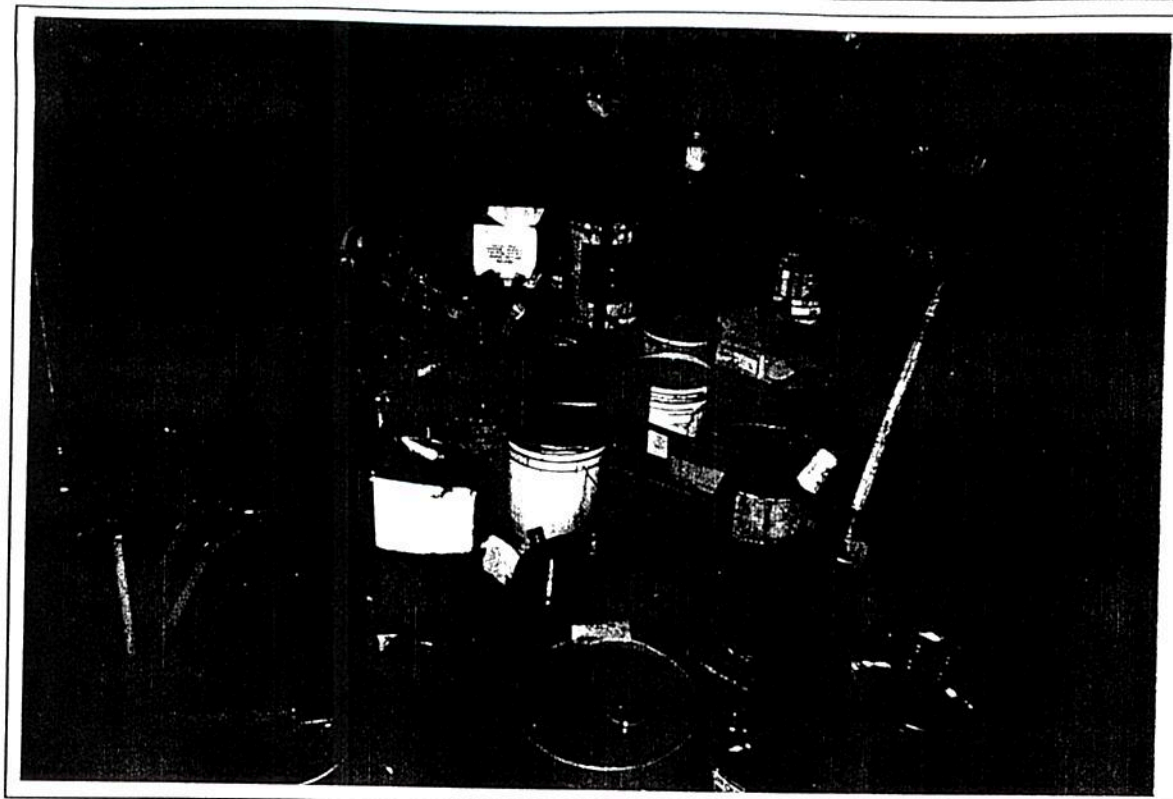


7f: Oil sheen originating from right bay door, and discharging onto Liberty Street.

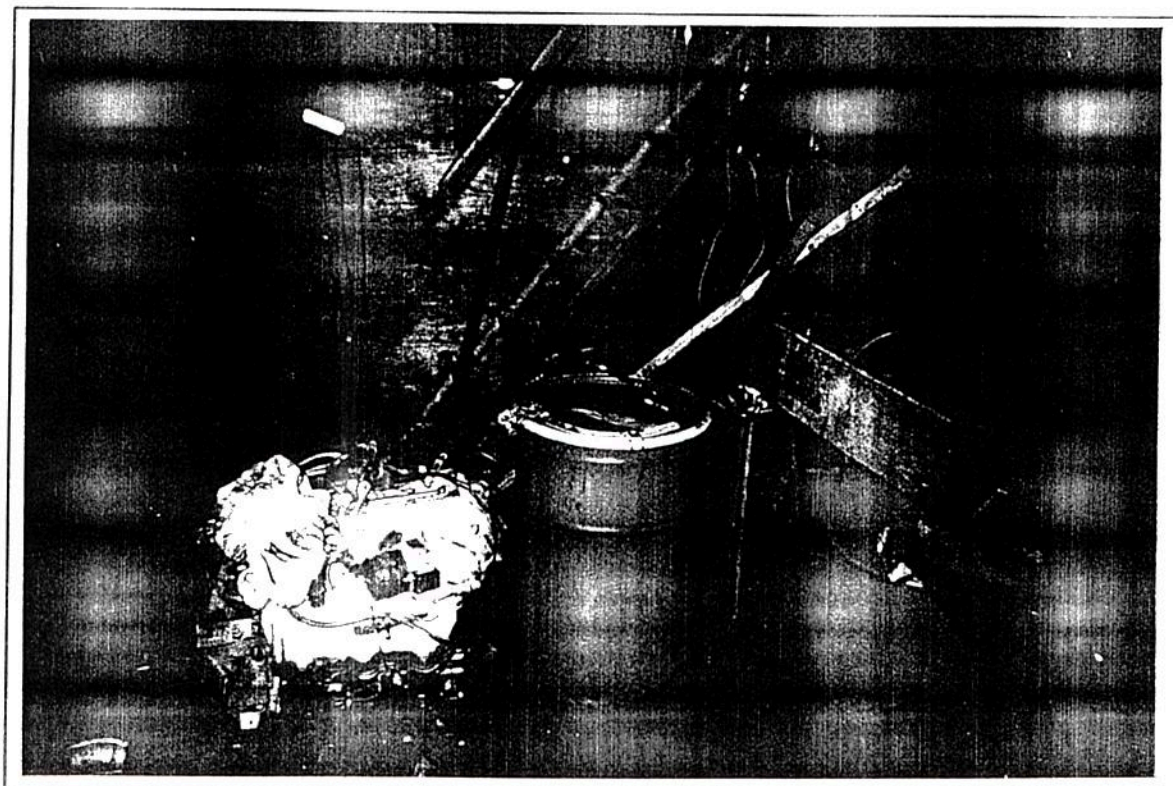
Site Photographs

Project:	Flowers ESA Phase I	Scale:	Not to Scale	Date:	4/27/00
Job No.:	00.137	Location:	Winston-Salem NC	Figure No.:	7e-7f
				Revision No.:	0

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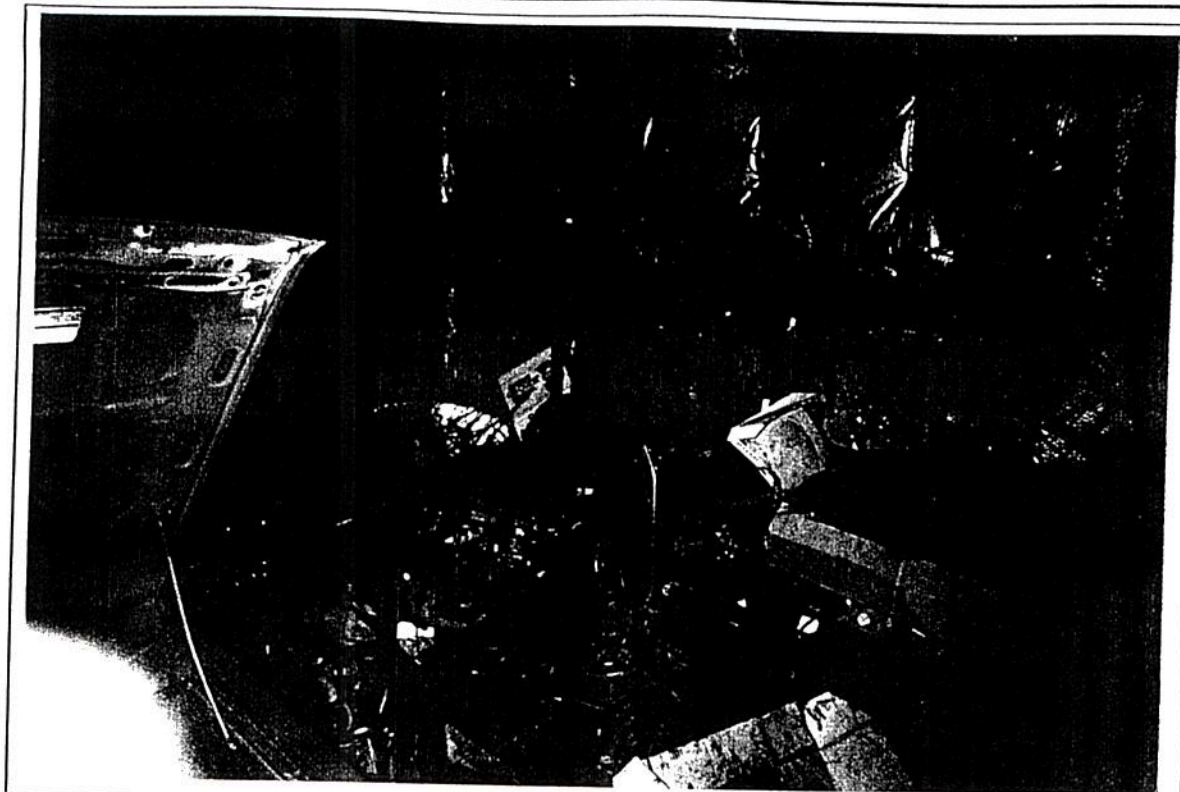


7g: Used oil containers inside structure.



7h: Safety-Kleen Premium Gold Drum.

Site Photographs	Project:	Flowers ESA Phase I	Scale:	Date:	GeoScience & Technology, P. A. <i>Practical Engineering & Environmental Solutions</i> Winston-Salem, NC (336) 896-1300
	Job No:	Location:	Figure No:	Revision No:	
	00137	Winston-Salem NC	7g-7h	0	



7i: Spare parts stored in the southwest corner of the structure.



7j: Spare parts room.

Site Photographs

Project:	Flowers ESA Phase I	Scale:	Date
		Not to Scale	4/27/00
Job No.	Location:	Figure No.	Revision No.
00137	Winston-Salem, NC	7i-7j	0

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APPENDICES

APPENDIX A
Forsyth County Tax Record



Forsyth County

North Carolina

Geo-Data Explorer

Tax Office

Contact

Help

Map Layers

Draw selected layers:

Draw Layers

- ☒ Tax Parcels ☐
- ☐ Blocks ☐
- ☐ Street Centerlines ☐
- ☐ Railroads ☐
- ☐ Streams ☐
- ☒ City Boundaries ☐
- ☐ Voting Districts ☐
- ☐ Zoning ☐

The following Map Layers are maintained by various agencies other than the Forsyth County Assessor's Office. They are provided as additional information to the user. The Forsyth County Assessor's Office makes no claims regarding the accuracy or completeness of this or any information contained on this site.

- ☐ Beltway Corridor
- ☐ Wards
- ☐ Census Tracts
- ☐ Fire Demand Zones
- ☐ FEMA Flood Panels

Flood Zone

- ☐ Schools
- ☐ Fire Stations
- ☐ Building Prints
- ☒ 10' Topo Lines
- ☒ Aerial Photography

Map Text Legend

Block **4700**

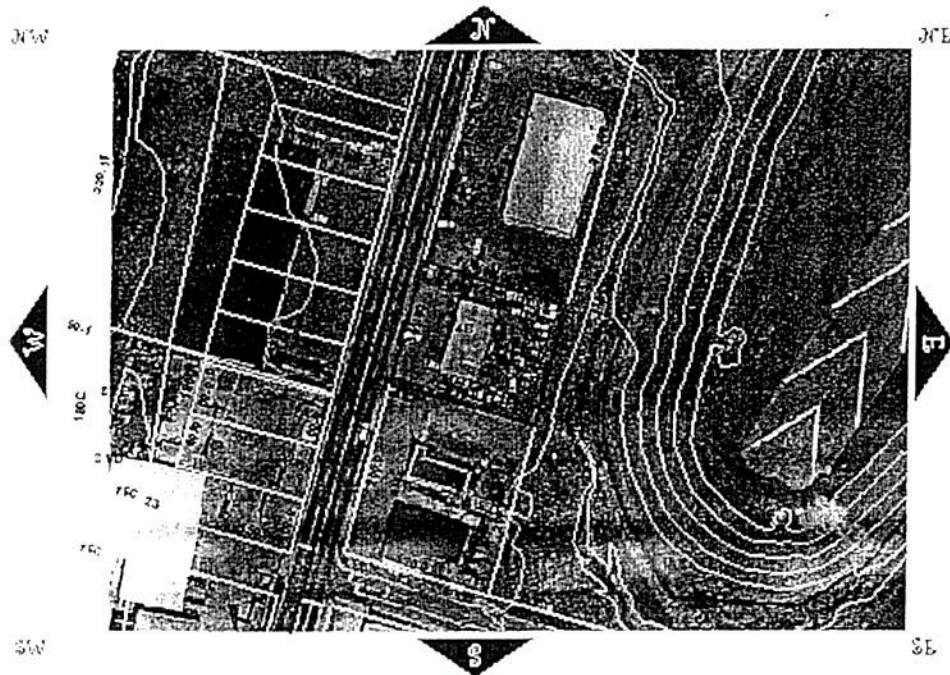
Property Address **74000**

Parcel Dimensions **120.0**

Click on the Map to:

☒ ZoomIn ☐ ZoomOut ☐ Recenter Map ☐ Select a Parcel ☐ Identify:

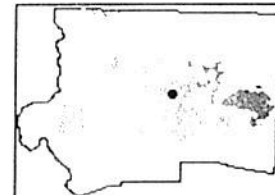
Zoom Factor:



SCALE 1 : 1846

Zoom In Zoom Out Full Extent

Reset Map



Parcel Data

Show Complete Property Record Card

- Block Lot: 3191 004B
- Additional Lots:
- Parcel ID (PIN): 6836-69-4302
- Map Number: 636866
- Land Value: \$56106
- Dwelling Value: \$0
- Commercial Value: \$41414
- Industrial Value: \$0
- Misc. Imp. Value: \$5340
- Real Value: \$102900
- Acres: .56
- Owner Name1: FLOWERS, BECKY T
- Owner Name2: FLOWERS, JIMMY C
- Company Name: --
- Owner Address: 804 WESTBOURNE GRV
- Owner City, St, Zip: COLFAX, NC 27235
- Deed Book/Page: 1866 / 255
- Deed Date: 07/28/1995
- Deed Stamp:
- Tax Jurisdiction: Winston-Salem
- Parcel Address: 3000 LIBERTY ST

APPENDIX B
Safety Kleen Premium Gold MSDS Information

SAFETY-KLEEN PREMIUM GOLD SOLVENT**MATERIAL SAFETY DATA SHEET FOR USA AND CANADA****SECTION 1: PRODUCT AND COMPANY IDENTIFICATION****PRODUCT NAME:** SAFETY-KLEEN PREMIUM GOLD SOLVENT**SYNONYMS:** Parts Washer Solvent; Petroleum Distillates; Petroleum Naptha;
Naptha, Solvent; Stoddard Solvent; Mineral Spirits.**PRODUCT PART
NUMBER:** 660455**PRODUCT USE:** Cleaning and degreasing metal parts.
If this product is used in combination with other products, refer to the
Material Safety Data Sheets for those products.

	24-HOUR EMERGENCY PHONE NUMBERS	
	MEDICAL:	TRANSPORTATION (SPILL):
These numbers are for emergency use only. If you desire non-emergency product information, please call a phone number listed below.	1-800-752-7869	1-800-468-1760 (USA)
	Extension 2	
	or 1-312-906-6194	1-613-996-6666 (CANADA) (call collect)

SUPPLIER: Safety-Kleen Corp.
1301 Gervais Street, Suite 300
Columbia, SC 29201
USA
1-803-933-4200**TECHNICAL INFORMATION:** 1-800-669-5740, Extension 7500**MSDS FORM NUMBER:** 82774**ISSUE:** April 14, 2000**ORIGINAL ISSUE:** January 21, 1999**SUPERSEDES:** Original**PREPARED BY:** Product MSDS Coordinator**APPROVED BY:** MSDS Task Force

SAFETY-KLEEN PREMIUM GOLD SOLVENT

MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

WT%	NAME	SYNONYM	CAS NO.	OSHA PEL		ACGIH TLV®		LD ^a	LC ^b
				TWA	STEL	TWA	STEL		
100	Distillates (petroleum), hydrotreated light ⁹	N.Av.	64742-47-8	500 ^d ppm	N.Av.	100 ^d ppm	N.Av.	>5000 ^c	>5500 ^d mg/m ³ /4 hours

N.Av. = Not Available

^aOral-Rat LD (mg/kg)^bInhalation-Rat LC^cBased on Stoddard solvent: Skin-RabbitLD₅₀ >3000 mg/kg^dBased on Stoddard Solvent.⁹Based on Stoddard Solvent, NIOSH IDLH

(Immediately Dangerous to Life or Health):

20000 mg/m³ (5000 ppm)

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE

Liquid, clear, colorless to pale yellow, mild hydrocarbon odor.

WARNING!

PHYSICAL HAZARD

Combustible liquid and vapor.

HEALTH HAZARDS

May be harmful if inhaled.

May irritate eyes and skin.

May be harmful if swallowed.

Contains material which may cause central nervous system damage.

ENVIRONMENTAL HAZARDS

Not toxic to aquatic life.

POTENTIAL HEALTH EFFECTS

INHALATION (BREATHING): High concentrations of vapor or mist may be harmful if inhaled. High concentrations of vapor or mist may irritate the respiratory tract (nose, throat, and lungs). High concentrations of vapor or mist may cause nausea, vomiting, headaches, dizziness, loss of coordination, numbness, and other central nervous system effects. Massive acute overexposure may cause rapid central nervous system depression, sudden collapse, coma, and/or death.

EYES: May cause irritation with watering, stinging, and/or redness.

SKIN: May cause irritation. Not likely to be absorbed through the skin in harmful amounts.

**SAFETY-KLEEN PREMIUM GOLD SOLVENT
MATERIAL SAFETY DATA SHEET FOR USA AND CANADA**

INGESTION (SWALLOWING): May be harmful if swallowed. May cause throat irritation, nausea, vomiting, and central nervous system effects as noted under **INHALATION (BREATHING)**. Breathing product into the lungs during ingestion or vomiting may cause lung injury and possible death.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with pre-existing respiratory tract (nose, throat, and lungs), central nervous system, eye, and/or skin disorders may have increased susceptibility to the effects of exposure.

CHRONIC: Prolonged or repeated inhalation may cause toxic effects as noted under **INHALATION (BREATHING)**. Prolonged or repeated inhalation and/or ingestion has been suggested to produce kidney toxicity in dogs but in no other species, including humans. According to one unsubstantiated human case report, prolonged or repeated inhalation, skin contact, and/or ingestion may cause mild, acute chemical hepatitis and acute, yellow atrophy (size reduction) of the liver. Prolonged or repeated eye contact may cause inflammation of the membrane lining the eyelids and covering the eyeball (conjunctivitis). Prolonged or repeated skin contact may cause drying, cracking, redness, itching, and/or swelling (dermatitis); and/or burns.

CANCER INFORMATION: No known carcinogenicity. For more information, see **SECTION 11: CARCINOGENICITY**.

Also see **SECTION 15: CALIFORNIA**.

POTENTIAL ENVIRONMENTAL EFFECTS

Product is not toxic to aquatic life. Also see **SECTION 12: ECOLOGICAL INFORMATION**.

SECTION 4: FIRST AID MEASURES

INHALATION: (BREATHING) Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Oxygen should only be administered by qualified personnel. Someone should stay with victim. Get medical attention if breathing difficulty persists.

EYES: If irritation or redness from exposure to vapor develops, move away from exposure into fresh air. Upon contact, immediately flush eyes with plenty of lukewarm water, holding eyelids apart, for 15 minutes. Get medical attention.

SKIN: Remove affected clothing and shoes. Wash skin thoroughly with soap and water. Get medical attention if irritation or pain develops or persists.

SAFETY-KLEEN PREMIUM GOLD SOLVENT

MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

**INGESTION:
(SWALLOWING)** Do NOT induce vomiting. Immediately get medical attention. Call 1-800-752-7869, extension 2 or 1-312-906-6194 for additional information. If spontaneous vomiting occurs, keep head below hips to avoid breathing the product into the lungs. Never give anything to an unconscious person by mouth.

**NOTE TO
PHYSICIANS:** Treat symptomatically and supportively. Administration of gastric lavage, if warranted, should be performed by qualified medical personnel. Treatment may vary with condition of victim and specifics of incident. Call 1-800-752-7869, extension 2 or 1-312-906-6194 for additional information.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: 148°F (64°C) (approximately) Tag Closed Cup

FLAMMABLE LIMITS IN AIR: **LOWER:** 0.7 VOL% (minimum)
UPPER: 5 VOL% (maximum)

**AUTOIGNITION
TEMPERATURE:** 410°F (210°C) (minimum)

**HAZARDOUS COMBUSTION
PRODUCTS:** Decomposition and combustion materials may be toxic. Burning may produce carbon monoxide and unidentified organic compounds.

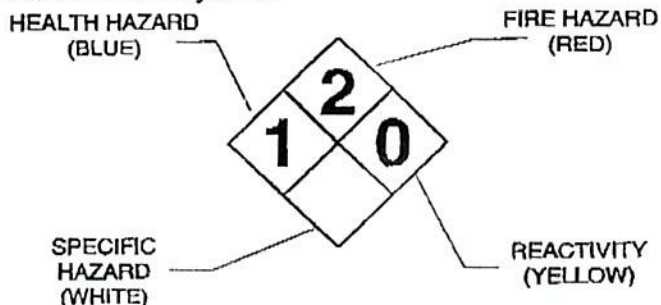
**CONDITIONS OF
FLAMMABILITY:** Heat, sparks, or flame.

EXTINGUISHING MEDIA: Carbon dioxide, regular foam, dry chemical, water spray, or water fog.

NFPA 704

HAZARD IDENTIFICATION:

This information is intended solely for the use by individuals trained in this system.



**SAFETY-KLEEN PREMIUM GOLD SOLVENT
MATERIAL SAFETY DATA SHEET FOR USA AND CANADA****FIRE FIGHTING
INSTRUCTIONS:**

Keep storage containers cool with water spray.
A positive-pressure, self-contained breathing apparatus (SCBA) and full-body protective equipment are required for fire emergencies.

**FIRE AND
EXPLOSION HAZARDS:**

Vapor explosion hazard indoors, outdoors, or in sewers. Vapors may travel to ignition source and flashback. Vapors will spread along the ground and collect in low or confined areas. Run-off to sewer may create a fire hazard. Heated containers may rupture. "Empty" containers may retain residue and can be dangerous. Not sensitive to mechanical impact. Product may be sensitive to static discharge, which could result in fire or explosion.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Remove all ignition sources. Do not touch or walk through spilled product. Stop leak if you can do it without risk. Wear protective equipment and provide engineering controls as specified in **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Ventilate area and avoid breathing vapor or mist. A vapor suppressing foam may be used to reduce vapors. Contain spill away from surface waters and sewers. Contain spill as a liquid for possible recovery or sorb with compatible sorbent material and shovel with a clean, sparkproof tool into a sealable container for disposal.

Additionally, for large spills: Water spray may reduce vapor, but may not prevent ignition in closed spaces. Dike far ahead of liquid spill for collection and later disposal.

SECTION 7: HANDLING AND STORAGE**HANDLING:**

Keep away from heat, sparks, or flame. Where flammable mixtures may be present, equipment safe for such locations should be used. Use clean, sparkproof tools and explosion-proof equipment. When transferring product, metal containers, including trucks and tank cars, should be grounded and bonded. Do not breathe vapor or mist. Use in a well ventilated area. Avoid contact with eyes, skin, clothing, and shoes. Do not smoke while using this product.

**SHIPPING AND
STORING:**

Keep container tightly closed when not in use and during transport. Do not pressurize, cut, weld, braze, solder, drill, or grind containers. Keep containers away from heat, flame, sparks, static electricity, or other sources of ignition. Empty product containers may retain product residue and can be dangerous. See **SECTION 14: TRANSPORT INFORMATION** for Packing Group information.

**SAFETY-KLEEN PREMIUM GOLD SOLVENT
MATERIAL SAFETY DATA SHEET FOR USA AND CANADA****SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

ENGINEERING CONTROLS: Provide general ventilation needed to maintain concentration of vapor or mist below applicable exposure limits. Where adequate general ventilation is unavailable, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Where explosive mixtures may be present, equipment safe for such locations should be used.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Use NIOSH-certified, air-purifying respirators with organic vapor cartridges respiratory protective equipment when concentration of vapor or mist exceeds applicable exposure limits. Protection provided by air-purifying respirators is limited. Selection and use of respiratory protective equipment should be in accordance in the USA with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4.

EYE PROTECTION: Where eye contact is likely, wear chemical goggles; contact lens use is not recommended.

SKIN PROTECTION: Where skin contact is likely, wear nitrile, supported neoprene, Viton®, polyvinyl alcohol (PVA), laminate (such as North Silver Shield®, Safety 4 4h®, Ansell Edmont Barrier®), or equivalent protective gloves; use of polyvinyl chloride (PVC), natural rubber (latex), or equivalent gloves is not recommended.

To avoid prolonged or repeated contact where spills and splashes are likely, wear appropriate chemical-resistant faceshield, boots, apron, whole body suits, or other protective clothing.

PERSONAL HYGIENE: Use good personal hygiene. Wash thoroughly with soap and water after handling product and before eating, drinking, or using tobacco products. Clean affected clothing, shoes, and protective equipment before reuse. Discard affected clothing, shoes, or protective equipment if they cannot be thoroughly cleaned. Discard leather articles, such as shoes, saturated with the product.

OTHER PROTECTIVE EQUIPMENT: Where spills and splashes are likely, facilities storing or using this product should be equipped with an emergency eyewash and shower, both equipped with clean water, in the immediate work area.

SAFETY-KLEEN PREMIUM GOLD SOLVENT

MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE, APPEARANCE, AND ODOR:	Liquid, clear, colorless to pale yellow, mild hydrocarbon odor.
ODOR THRESHOLD:	30 ppm (based on Stoddard Solvent)
MOLECULAR WEIGHT:	Not available.
SPECIFIC GRAVITY:	0.78 to 0.82 at 60°F/60°F (15.6°C/15.6°C) (water = 1)
DENSITY:	6.5 to 6.8 LB/US gal (780 to 820 g/l)
VAPOR DENSITY:	5 (air = 1) (approximately)
VAPOR PRESSURE:	0.2 mm Hg at 68°F (20°C) (approximately) 0.6 mm Hg at 100°F (38°C) (approximately)
BOILING POINT:	350°F (177°C) (initial)
FREEZING/MELTING POINT:	-45°F (-43°C) (maximum)
pH:	Not applicable.
EVAPORATION RATE:	0.1 (butyl acetate = 1) (based on Stoddard Solvent)
SOLUBILITY IN WATER:	Insoluble.
FLASH POINT:	148°F (64°C) (approximately) Tag Closed Cup
FLAMMABLE LIMITS IN AIR:	LOWER: 0.7 VOL% (minimum) UPPER: 5 VOL% (maximum)
AUTOIGNITION TEMPERATURE:	410°F (210°C) (minimum)

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	Stable under normal temperatures and pressures. Avoid heat, sparks, or flame.
INCOMPATIBILITY:	Avoid acids, alkalies, oxidizing agents, reducing agents, or reactive halogens.

**SAFETY-KLEEN PREMIUM GOLD SOLVENT
MATERIAL SAFETY DATA SHEET FOR USA AND CANADA**

REACTIVITY: Polymerization is not known to occur under normal temperatures and pressures. Not reactive with water.

**HAZARDOUS
DECOMPOSITION
PRODUCTS:** None under normal temperatures and pressures. See
also **SECTION 5: HAZARDOUS COMBUSTION PRODUCTS.**

SECTION 11: TOXICOLOGICAL INFORMATION

SENSITIZATION: Based on best current information, there is no known human sensitization associated with this product.

MUTAGENICITY: Based on best current information, there is no known mutagenicity associated with this product.

CARCINOGENICITY: Based on best current information, there is no known carcinogenicity as regulated by OSHA; as categorized by ACGIH A1 or A2 substances; as categorized by IARC Group 1, Group 2A, or Group 2B agents; or as listed by NTP as either known carcinogens or substances for which there is limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals.

Also see **SECTION 15: CALIFORNIA.**

**REPRODUCTIVE
TOXICITY:** Based on best current information, there is no known reproductive toxicity associated with this product.

Also see **SECTION 15: CALIFORNIA.**

TERATOGENICITY: Based on best current information, there is no known teratogenicity associated with this product.

**TOXICOLOGICALLY
SYNERGISTIC
PRODUCT(S):** Based on best current information, there are no known toxicologically synergistic product associated with this product.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY: A Static Acute Bioassay as per the California Department of Fish and Game WPCL, was done using fathead minnows, and up to 750 ppm of the product in water.

The material passed the bioassay with only 1 out of 10 minnows dying. To fail the bioassay, more than 40% of the fish would die in 750 ppm.

SAFETY-KLEEN PREMIUM GOLD SOLVENT

MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

OCTANOL/WATER

PARTITION COEFFICIENT: Not available.

VOLATILE ORGANIC COMPOUNDS:

100 WT%; 6.5 to 6.8 LB/US gal; 780 to 820 g/l
As per 40 CFR Part 51.100(s).

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL: Dispose in accordance with federal, state, provincial, and local regulations. Regulations may also apply to empty containers. The responsibility for proper waste disposal lies with the owner of the waste. Contact Safety-Kleen regarding recycling or proper disposal.

USEPA WASTE CODE(S):

Not regulated.
Based on available data, this information applies to the product as supplied to the user. Processing, use, or contamination by the user may change the waste code(s) applicable to the disposal of this product.

SECTION 14: TRANSPORT INFORMATION

DOT: COMBUSTIBLE LIQUID, N.O.S. (PETROLEUM NAPHTHA), NA1993, PG III

TDG: Not regulated.

EMERGENCY RESPONSE GUIDE NUMBER:

128
Reference *North American Emergency Response Guidebook*

SECTION 15: REGULATORY INFORMATION

USA REGULATIONS

SARA SECTIONS 302 AND 304:

Based on the ingredient listed in **SECTION 2**, this product does not contain any "extremely hazardous substances" listed pursuant to Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) Section 302 or Section 304 as identified in 40 CFR Part 355, Appendix A and B.

SARA SECTIONS 311 AND 312:

This product poses the following physical and health hazards as defined in 40 CFR Part 370 and is subject to the requirements of sections 311 and 312 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA):

Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard
Fire Hazard

**SAFETY-KLEEN PREMIUM GOLD SOLVENT
MATERIAL SAFETY DATA SHEET FOR USA AND CANADA****SARA SECTION
313:**

This product does not contain toxic chemicals subject to the requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

CERCLA:

Based on the ingredient listed in **SECTION 2**, this product does not contain any "hazardous substance" listed pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) in 40 CFR Part 302, Table 302.4.

TSCA:

All the components of this product are listed on the TSCA Inventory.

CALIFORNIA:

This product may contain detectable amounts of benzene CAS 71-43-2 (at or below 0.4 mg/L) and p-dichlorobenzene CAS 106-46-7 (at or below 5 mg/L). **WARNING:** These chemicals are known to the State of California to cause cancer.

This product may contain detectable amounts of benzene CAS 71-43-2 (at or below 0.4 mg/L) and toluene CAS 108-88-3 (at or below 30 mg/L). **WARNING:** These chemicals are known to the State of California to cause birth defects or other reproductive harm.

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS:

B3, D2B

**CANADIAN
ENVIRONMENTAL
PROTECTION ACT
(CEPA):**

All the components of this product are listed on the Canadian Domestic Substances List (DSL).

SAFETY-KLEEN PREMIUM GOLD SOLVENT

MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

SECTION 16: OTHER INFORMATION

REVISION INFORMATION:

Revised format. This MSDS has been revised in the following sections:

SECTION 3: Emergency Overview, Inhalation, Chronic

SECTION 4: Ingestion

SECTION 5: Upper Flammable Limit, Autoignition Temperature

SECTION 8: Skin Protection

SECTION 9: Molecular Weight

SECTION 12: Ecotoxicity

SECTION 16: Label/Other Information

LABEL/OTHER INFORMATION:

This product meets MIL Specification PD680B, Type II and/or MIL-PRF 680C, Type II. For compliance documentation, please contact your local Safety-Kleen representative.

This product is United States Department of Agriculture (USDA) approved and Underwriter's Laboratories (UL) classified.

User assumes all risks incident to the use of this product. To the best of our knowledge, the information contained herein is accurate. However, Safety-Kleen assumes no liability whatsoever for the accuracy or completeness of the information contained herein. No representations or warranties, either express or implied, or merchantability, fitness for a particular purpose or of any other nature are made hereunder with respect to information or the product to which information refers. The data contained on this sheet apply to the product as supplied to the user.



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** TOTAL PAGE.12 **

APPENDIX C
NC DENR Incident File Information

**SOIL AND UST REMOVAL
DIXIE CONCRETE
WINSTON-SALEM, NORTH CAROLINA**

Prepared for:

William Davis

Prepared by:
Bain, Palmer & Assoc., Inc.
2641-G Randleman Road
Greensboro, NC 27406
(919) 272-9713
January 14, 1991

RECEIVED
N.C. Dept. NRCD

JAN 17 1991

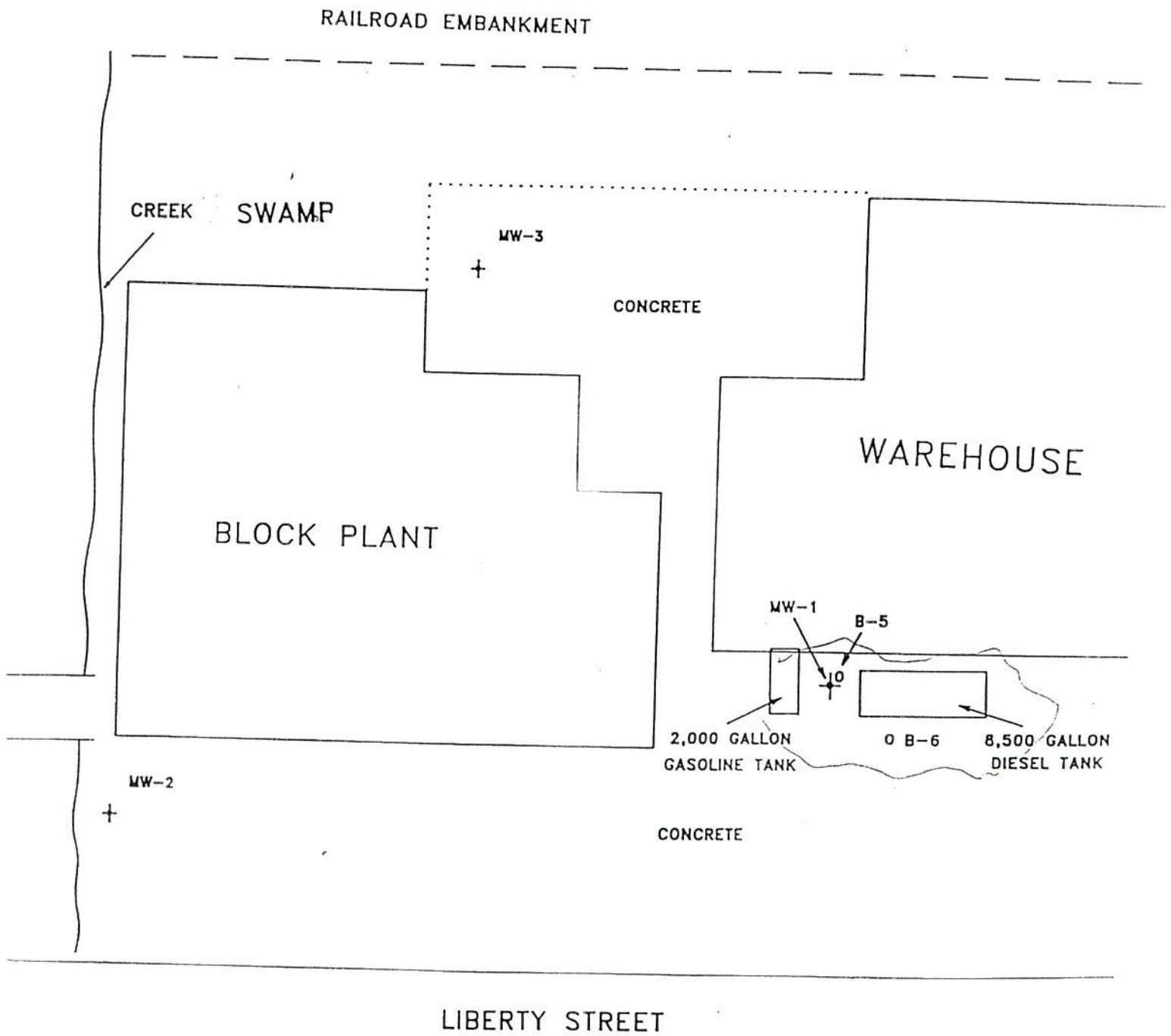
Winston-Salem
Regional Office

TABLE 1
Laboratory Results:
Water Sample

Compound	Concentration
Acetone	6,300
Benzene	5,200
1,2-Dichloroethane	1,600
Toluene	1,600
Xylenes (Total)	2,300

Note: Results are presented in ug/L or
parts per billion

FIGURE 2
SITE LOCATION MAP



30
SCALE IN FEET

EXPLANATION

- B-1 TEST BORING
- + MW-1 MONITOR WELL

GC/MS PURGEABLES
SW-846 METHOD 8240

IEA Sample Number: 631-125(0)-1

Sample Identification: WS-1

Date Analyzed: 11/30/90

By: Stephenson

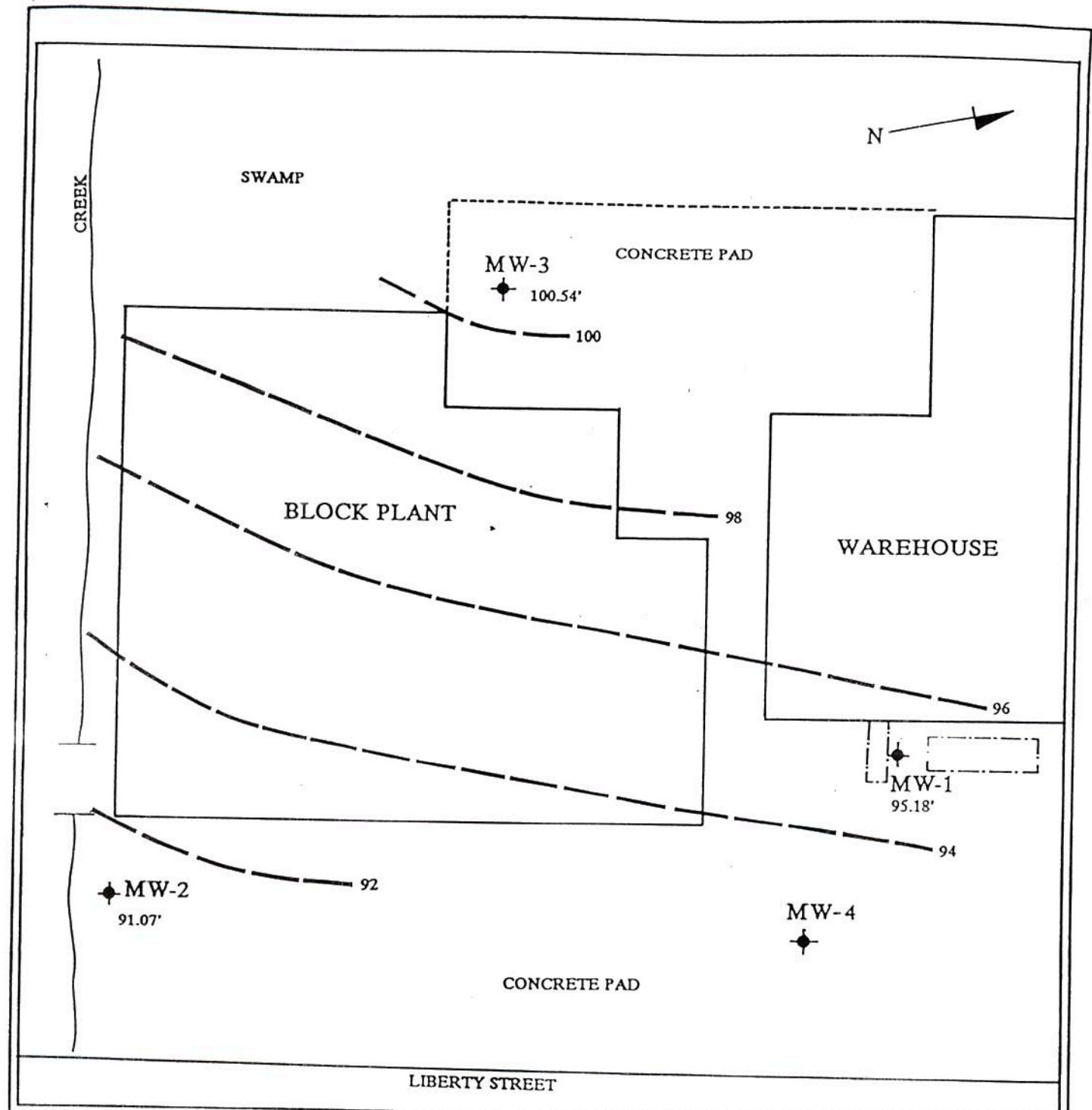
Number	Compound	Quantitation Limit (ug/L)	Results Concentration (ug/L)
1	Acetone	5,000	6,300
2	Benzene	250	5,200
3	Bromodichloromethane	250	BQL
4	Bromoform	250	BQL
5	Bromomethane	500	BQL
6	2-Butanone	5,000	BQL
7	Carbon disulfide	250	BQL
8	Carbon tetrachloride	250	BQL
9	Chlorobenzene	250	BQL
10	Dibromochloromethane	250	BQL
11	Chloroethane	500	BQL
12	2-Chloroethylvinyl ether	500	BQL
13	Chloroform	250	BQL
14	Chloromethane	500	BQL
15	1,1-Dichloroethane	250	BQL
16	1,2-Dichloroethane	250	1,600
17	1,1-Dichloroethene	250	BQL
18	1,2-Dichloroethene (total)	250	BQL
19	1,2-Dichloropropane	250	BQL
20	cis-1,3-Dichloropropene	250	BQL
21	trans-1,3-Dichloropropene	250	BQL
22	Ethylbenzene	250	1,600
23	2-Hexanone	2,500	BQL
24	Methylene chloride	250	BQL
25	4-Methyl-2-pentanone	2,500	BQL
26	Styrene	250	BQL
27	1,1,2,2-Tetrachloroethane	250	BQL
28	Tetrachloroethene	250	BQL
29	Toluene	250	8,100
30	1,1,1-Trichloroethane	250	BQL
31	1,1,2-Trichloroethane	250	BQL
32	Trichloroethene	250	BQL
33	Vinyl acetate	2,500	BQL
34	Vinyl chloride	500	BQL
35	Xylenes (total)	250	2,300

Comments:

BQL = Below Quantitation Limit

Quantitation limit elevated due to sample dilution prior to analysis.

Sample diluted due to high concentration of target compounds present.



EXPLANATION

- APPROXIMATE LOCATION OF UNDERGROUND STORAGE TANK
- EDGE OF CONCRETE PAD
- CONTOUR OF ESTIMATED ELEVATION FROM WATER LEVELS MEASURED ON 4/18/90
- MONITOR WELL
- 91.07' WATER TABLE ELEVATION

NOTE: MW-1 REMOVED



DIXIE CONCRETE

BAIN, PALMER & ASSOCIATES, INC.

MONITOR WELL
LOCATION MAP

SITE NAME Dixie Concrete Co. - Liberty Dr.
REGULATED ☒ NONREGULATED ☐

CLEANUP INITIATED YES NO CLEANUP COMPLETED / /

TANKS ABANDONED-IN-PLACE _____

CLEANUP COMPLETED / /

What Is Needed And Comments

LSA Addressing diesel
gasoline & waste oil tanks



JAMES B. HUNT JR.
GOVERNOR

WAYNE McDEVITT
SECRETARY

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
WINSTON-SALEM REGIONAL OFFICE
DIVISION OF WATER QUALITY
GROUNDWATER SECTION

30 July 1998

MEMORANDUM

To: File - Wachovia Oil Co. - Bulk Plant; Incident No. 10315; Incident Ranking E/060

From: Don Geddes, Hydrogeologist, Winston-Salem Regional Office *JD*

Subject: Non-UST Issues

I have reviewed the subject file as it relates to the non-UST issues (chlorinated solvent contamination and the additional petroleum source near the northern bulk loading rack). The following is a summary of my findings and interpretations.

Chlorinated Solvents

Since 1992, only four of the eleven monitor wells on-site have shown levels of solvents over the 2L limit. The most recent rounds of sampling (1995 and 1996) have only shown two on-site wells with concentrations over the 2L standards, at levels barely twice the limit. Analysis of the split samples collected from recovery wells RW-1B and RW-2B by myself and a representative from Atlanta Testing & Engineering (1 April 1998), found only one chlorinated compound above the 2L standards. These on-site levels are lower and more sporadic than those found in off-site wells. This distribution of contaminant concentrations suggests the source is either upgradient or cross-gradient to the Wachovia property. A source located on the Wachovia property (with the present distribution of compounds) would require the plume to be circular in shape, rather than elliptical as is normally the case in this type of hydrogeologic environment.

Therefore, it appears that the source of chlorinated solvents is not on the subject property. It is possible that the source of these compounds is the old unregistered "landfill" that allegedly occupied this site, and that this contamination was not caused by the actions of any subsequent businesses in the area.

Additional Petroleum Contamination

The mysterious appearance (in the NPDES permit application) of a third petroleum plume and the last-minute addition of two recovery wells near the northern bulk rack seemed to indicate a leak from the (former) 1 million-gallon AST or associated piping. The contractor who installed those wells indicated that while digging a trench to install an infiltration gallery, "free product" was noticed coming into the trench onto the surface

of the pit water. The amount entering the pit was "not substantial". The two recovery wells were installed in the trench and the trench was backfilled with gravel (creating a sump) to contain whatever plume was in the area. The third plume sketched on the permit application was just an estimate based on what was seen in the trench. The source was not determined, but could have been the AST, underground piping, the bulk rack, or spills/overfills. The contractor feels that, based on how much product was observed, the pumping of those two wells should have removed the problem. The split samples collected from RW-1B and RW-2B on 1 April 1998 support this theory: only two unidentified semi-volatiles at estimated concentrations of 63 and 74 ppb, and one tentatively identified semi-volatile at 4 ppb were present in the samples.

Therefore, it appears that the contamination in the area of the northern bulk loading rack was limited and seems to have been remediated by pumping wells RW-1B and RW-2B.

Conclusion

The non-UST issues have been resolved to the extent that they were investigated, and the only remaining issues involve the USTs and related trust fund implications.



JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY



NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
WINSTON-SALEM REGIONAL OFFICE

DIVISION OF WASTE MANAGEMENT
UST SECTION

July 26, 1999

Mr. Bill Shelton
Quality Oil Company, LLC
PO Box 2736
Winston-Salem, NC 27102-2736

RE: Notice of No Further Action 15A NCAC 2L.0115(h)
RISK-BASED ASSESSMENT AND CORRECTIVE ACTION FOR
PETROLEUM UNDERGROUND STORAGE TANKS at
Former Wachovia Bulk Oil, 1095 Fairchild Drive
Winston-Salem, Forsyth County Incident #10315--Low Risk

Dear Mr. Shelton:

On July 22, 1999 the Division of Waste Management (DWM) Winston-Salem Regional Office received recent water quality data for the above referenced site. A review of this report shows that the contaminated groundwater does not exceed gross contamination levels that were established in 15A NCAC 2L .0115(g). Previous reports indicate that the soil has been cleaned up to satisfactory levels.

Based on information provided to date, the DWM determines that no further action is required for this incident. This determination is conditional pending completion of the public notice specified below. Once proper public notice has been given, this determination will apply unless the DWM later determines that the discharge or release poses an unacceptable risk or a potentially unacceptable risk to human health or the environment. This no further action determination only applies to the above-referenced incident and that for any other incidents, the responsible party is expected to continue to address the contamination as required by the applicable rules and in accordance with any previously issued notices.

Please be advised that because contaminated groundwater has not been restored to the level of the standard or interim standard established in 15A NCAC 2L. 0202, groundwater within the area of contamination or within the area where contamination is expected to migrate, is not suitable for use as a water supply.

Pursuant to 15A NCAC 2L.0115(e), you have a continuing obligation to notify the DWM of any changes that you know of or should know of, that might affect the level of risk assigned to the discharge or release. Such changes include, but are not limited to, changes in zoning of real property, use of real property or the use of groundwater that has been contaminated or is expected to be contaminated by the discharge or release if such change could cause the DWM to reclassify the risk. Please note that this responsibility not only pertains to changes involving the property on which the release occurred, but to changes involving the surrounding properties as well.

Please be advised that you must comply with the public notice requirements of 15A NCAC 2L.0115(k) as specified below. If public notice is not provided as required, this no further action determination will be deemed invalid. Within 30 days of receipt of this no further action notice, you must provide a copy of this notice to the following persons:

- b local health director;
- b chief administrative officer (i.e., Mayor, Chairman of the County Commissioners, County Manager, City Manager or other official of equal or similar position) of each political jurisdiction in which the contamination occurs;
- b all property owners and occupants within or contiguous to the area containing contamination; and
- b all property owners and occupants within or contiguous to the area where the contamination is expected to migrate.

Copies of this no further action notice must be sent to the persons listed above by certified mail. If it is impractical to provide notice by certified mail to the occupants of apartment building, condominiums, office buildings, etc., you may post a copy of this notice in a prominent place where the occupants are most likely to see it.

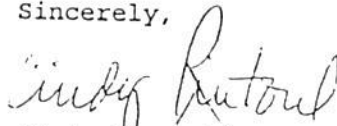
Within 60 days of receiving this no further action notice, you must provide the DWM Winston-Salem Regional Office with proof of receipt of the copy of the notice or refusal by the addressee to accept delivery of the copy of the notice. If a copy of the notice is posted, you must provide the DWM with a description of the manner in which the notice was posted.

Interested parties may examine the reports and other file material by contacting the Winston-Salem Underground Storage Tank Section at the letterhead number. In addition, comments on the reports may be submitted to the regional office at the letterhead address.

Please be advised that you must close any monitoring wells or injection wells used to investigate or remediate this incident in accordance with 15A NCAC 2C.0113 an.214, respectively.

Should you have any questions concerning this notice, please contact Cindy Rintoul at the letterhead number.

Sincerely,



Cindy Rintoul
Supervisor, UST Section



atlanta testing
& engineering

130 penmarc drive / suite 101 / raleigh, north carolina 27603 / phone (919) 832-1554 / fax (919) 832-1588

May 14, 1998

Mr. Donald Geddes
Winston-Salem Regional Office
North Carolina Department of Environment and Natural Resources
585 Waughtown Street
Winston-Salem, North Carolina 27107

RECEIVED
N.C. Dept. of ENR
MAY 18 1998
Winston-Salem
Regional Office

Re: Former Wachovia Oil Bulk Terminal
1095 Fairchild Drive
Winston-Salem, NC
GW Incident No. 10315
AT&E Job No. R-1068

Dear Mr. Geddes:

On behalf of our client, Wachovia Southern Oil Company (Wachovia), Atlanta Testing and Engineering (AT&E) is pleased to provide the latest water quality data and site information for the former Wachovia Oil Bulk Terminal facility in Winston-Salem, NC (Figures 1 and 2). The information requested by the North Carolina Department of Environment and Natural Resources (NCDENR) was discussed during our March 18, 1998 meeting at the Winston-Salem Regional Office. Specifically, Wachovia was to complete the following tasks:

- 1) Determine whether or not a release of petroleum hydrocarbons had occurred in the vicinity of a reported leaking product supply line from an above ground storage tank system; and
- 2) Try to determine the source of the chlorinated compounds that had been previously detected in the groundwater monitoring wells at the site by reviewing the history of the former Wachovia property and information for the adjoining properties.

AT&E has completed the above tasks and presents the findings below.

GROUNDWATER SAMPLING AND LABORATORY ANALYSES

On April 1, 1998, the two recovery wells, RW-1B and RW-2B, which are located in the recovery trench installed near the reported leak from the above ground storage tank system (Figure 3), were purged and sampled. The samples were collected using polyethylene disposable bailers after purging a minimum of three well volumes of water from each of the wells. The samples were shipped in an



iced cooler along with completed chain of custody documentation to a NC certified laboratory for analysis. The samples were analyzed per EPA Methods 601/602 including methyl-tert-butyl-ether (MTBE), ethylene dibromide (EDB), and isopropyl ether (IPE) and EPA Method 625 including the first ten tentatively identified compounds (TICs). The samples were also split with a NCDENR representative for analysis by a state contract laboratory.

The laboratory results indicate that 1,1-dichloroethane and 1,1-dichloroethene were detected in the water sample collected from well RW-1B at concentrations of 4.70 micrograms per liter (ug/l) and 1.95 ug/l, respectively. The results for the water sample collected from well RW-2B indicate that 1,1-dichloroethane, 1,1-dichloroethene, trans-1,2-dichloroethene, and 1,1,1-trichloroethane were detected at concentrations of 39.4 ug/l, 20.3 ug/l, 5.87 ug/l, and 11.6 ug/l, respectively. No other compounds were detected in the water samples. A copy of the laboratory report is enclosed.

According to monitoring data obtained on December 16, 1997 for the wells on the adjacent former Decodex property, the general groundwater flow direction is to the south (Figure 4). Based on the southerly flow direction, the wells on the Wachovia property are located sidegradient to the Decodex site. Review of the latest water quality data for wells RW-1B, RW-2B, and FC-2 indicates that the chlorinated compound concentrations also increase to the east near the property line of the Decodex property (Figure 4). In addition, other EPA Method 601 compounds (cis-1,2-dichloroethane, tetrachloroethene, and trichloroethene) were detected in the latest water samples collected from the wells on the Decodex property that were not detected in the wells on the Wachovia property (Figure 4). Therefore, based on the groundwater flow direction and the water quality data, the chlorinated compounds appear to have originated from a source other than the Wachovia site, possibly to the east or northeast. The chlorinated compounds may have been drawn to wells RW-1B and RW-B by the groundwater recovery system..

INFORMATION ON WACHOVIA OIL SITE AND SURROUNDING PROPERTIES

According to Mr. Finley Long, previous owner of Wachovia Oil Company, the former Wachovia property was purchased in 1972 when the petroleum bulk terminal was built. Prior to 1972, the property was a vacant field. Mr. Long reported that only petroleum products were stored/used at the site.

An environmental regulatory survey report, prepared by VISTA Information Solutions, Inc.(VISTA), was ordered by AT&E to determine the locations of permitted and unpermitted facilities/sites (i.e., registered and/or leaking underground storage tanks (USTs), RCRA permitted facilities, reported spills, etc.) with known or potential environmental concerns in the area. The report indicates that

17 LUST facilities, one CERCLIS site, and one large generator of hazardous waste are present within a 0.5 mile radius of the Wachovia site. The CERCLIS site, which is also the hazardous waste generator, is located the Sun Chemical Specialty Inks facility to the south and across Fairchild Road from the Wachovia Oil site (Figures 2 and 3). One of the LUST sites is the former Wachovia Oil facility. No environmental concerns have been reported for the adjoining former Decodex property to the east or the Forsyth County property to the west and north. A copy of the VISTA report is enclosed.

Based on a telephone conversation with a representative of the Winston-Salem sanitation department, a closed (unregulated) landfill is located adjacent to the airport runways to the north of the site. The closed landfill reportedly ends approximately 500 feet from Fairchild Road. The representative also indicated that other industries utilized the property between the city landfill and Fairchild Road for disposal purposes.

CONCLUSIONS AND RECOMMENDATIONS

According to the laboratory results for the groundwater samples collected from the recovery wells, no petroleum compounds were detected. In addition, as indicated in previous correspondence, no elevated organic vapors were reported on a soil boring record for boring BH-18, which was installed within 2 feet of the reported leaking product supply line. Therefore, the previously reported leak from the above ground storage tank system does not appear to have significantly impacted the soil and groundwater at the site.

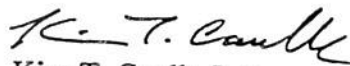
Based on the environmental regulatory survey, the source of the chlorinated compounds remains uncertain. According to former Wachovia Oil personnel, only petroleum products were stored on the Wachovia property. The latest groundwater monitoring data suggests that the chlorinated compounds may have originated from an offsite source. We recommend that the NCDENR investigate the past business activities at the Decodex property to the east and/or the suspected disposal activities on the properties to the north and northeast of the Wachovia site.

Mr. Donald Geddes
Page 4


If you have any questions or need additional information, please feel free to call us at (919)832-1554.

Sincerely,

ATLANTA TESTING AND ENGINEERING


Kim T. Caulk, P.G.
Project Hydrogeologist
NC License No. 1559



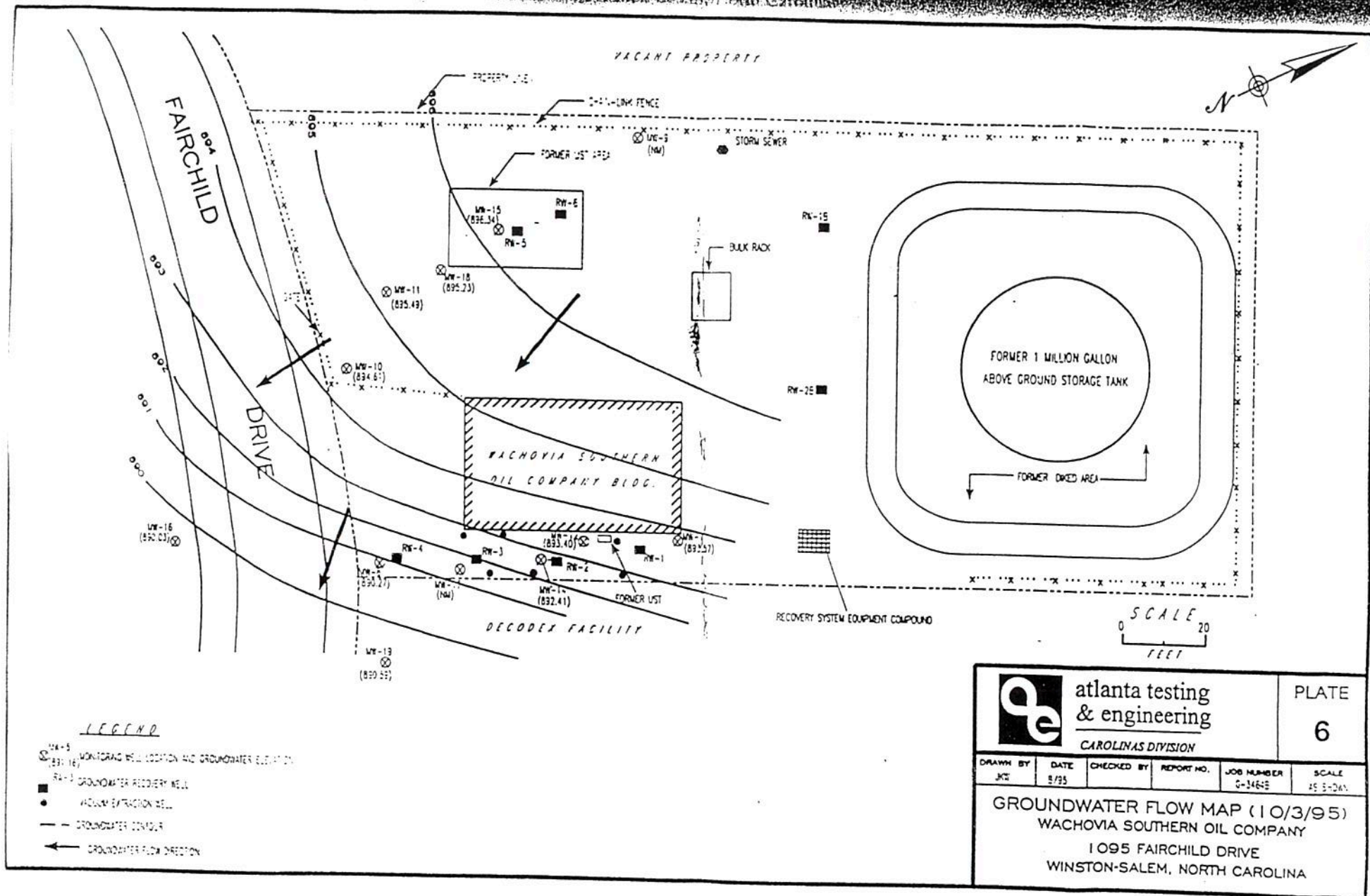

For Thomas F. Donn, P.G.
Manager - Environmental Services

cc: Mr. Finley Long, Wachovia Oil
Mr. Jack Stonebraker, Action Environmental
Ms. Cindy Rintoul, NCDENR ✓
Ms. Sherri Knight, NCDENR

TABLE NO. 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
WACHOVIA SOUTHERN OIL COMPANY
1095 FAIRCHILD DRIVE
WINSTON-SALEM, NORTH CAROLINA
Page 1 of 2

Well No.	Date	Chloroform (ug/l)	1,1 Dichloro- ethane (ug/l)	1,1 Dichloro- ethene (ug/l)	Tetra- Chloro- ethene (ug/l)	Trichloro- ethene (ug/l)	Cis 1,2 Dichloro- ethylene (ug/l)	1,2 Dichloro- ethane (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl benzene (ug/l)	Xylenes (ug/l)	Naphtha- lene (ug/l)	MTBE (ug/l)
NCDEM MCL	—	0.19	700	7.0	0.7	2.8	70.0	0.38	1.0	1000	29	400	NE	200
MW-7	10/14/94	5.0	BDL	BDL	BDL	8.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA
	04/18/95	BDL	1.4	3.9	1.4	13.3	1.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	10/03/95	BDL	2.3	1.4	2.9	10.6	3.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-8	10/14/94	BDL	BDL	BDL	BDL	BDL	BDL	BDL	22.0	BDL	BDL	BDL	BDL	NA
	04/18/95	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5.2	BDL	BDL	BDL	27.0	NA
MW-10	10/14/94	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5.9	BDL
	04/18/95	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA
	10/03/95	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.3	BDL	BDL	BDL	BDL
MW-11	10/14/94	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA
	04/18/95	BDL	BDL	BDL	BDL	BDL	BDL	1.8	BDL	BDL	BDL	BDL	BDL	NA
MW-12	10/14/94	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	04/18/95	BDL	BDL	BDL	BDL	BDL	2.0	BDL	BDL	BDL	BDL	BDL	2.38	NA
MW-14	10/14/95	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	04/18/95	BDL	1.2	3.2	BDL	4.6	1.3	BDL	BDL	BDL	BDL	BDL	4.82	NA
MW-15	10/14/94	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2.2	1.9	22.7	BDL
	04/18/95	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA
									1.0	1.2	BDL	BDL	BDL	BDL



1455 Fairchild Road
Winston-Salem, North Carolina

Sample Area	Well ID	Sample Date	Lead (mg/l)	Chromium (mg/l)	TCFM	1,1-DCE	1,1,2-DCE	TCE	PCE	1,1,1-TCA	Chlorobenzene	Chloroform	1,1 DCA	c-1,2 DCE
ACA	MW - 5	2/6/96	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
		3/14/96	<.004	<0.030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		7/8/96	<.004	<0.030	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
		5/16/97	<0.0050	0.037	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Courtyard	MW - 6	2/6/96	NA	NA	<50	<50	<50	<50	2000	160	<50	<50	<50	<50
		3/14/96	<.004	0.075	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		7/8/96	<.004	0.077	<100	<100	<100	<100	540	120	<100	<100	<100	<100
		7/8/1996(D)	0.0082	0.0001	<10	17	<10	<10	510	83	<10	<10	<10	<10
		5/17/97	<0.0050	0.26	<1000	<1000	<1000	<1000	14000	<1000	<1000	<1000	<1000	<1000
	MW - 11C	5/19/97	0.0082	0.02	<1.0	<1.0	<1.0	<1.0	2.1	120	<1.0	4.2	<1.0	15
	MW - 12D	5/19/97	<0.0050	<0.0050	<1.0	1.3	<1.0	<1.0	4.9	6.0	<1.0	<1.0	<1.0	<1.0
	MW - 13C	5/19/97	0.0069	0.0065	<1.0	<1.0	<1.0	<1.0	7.4	<1.0	<1.0	<1.0	<1.0	<1.0
DG	MW - 7	2/13/96	NA	NA	<5.0	<5.0	<5.0	16	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
		3/14/96	<.004	<0.030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		7/8/96	<.004	<0.030	<1.0	<1.0	<1.0	5.8	2.9	1.0	<1.0	<1.0	<1.0	<1.0
		5/16/97	0.0067	<0.0050	<1.0	<1.0	<1.0	12	3.4	<1.0	<1.0	<1.0	<1.0	6.8
FSS	MW - 1	2/9/96	NA	NA	<5.0	<5.0	91	7.6	280	<5.0	<5.0	<5.0	<5.0	<5.0
		3/14/96	0.036	<0.030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		7/8/96	0.041	<0.030	<10	<10	<10	21	890	<10	<1.0	<1.0	<1.0	<1.0
		5/16/97	0.23	0.034	<1.0	<1.0	<1.0	6.4	280	<1.0	<1.0	1.1	<1.0	68
	MW - 8C	5/19/97	0.015	0.0059	<1.0	<1.0	<1.0	45	99	<1.0	<1.0	<1.0	<1.0	21
	MW - 9C	5/19/97	<0.0050	0.017	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	4.1	<1.0	<1.0
	MW - 10D	5/19/97	<0.0050	<0.0050	<1.0	<1.0	<1.0	<1.0	4.7	<1.0	<1.0	<1.0	<1.0	<1.0

Sample Area	Well ID	Sample Date	Lead (mg/l)	Chromium (mg/l)	TCFM	1,1-DCE	t-1,2-DCE	TCE	PCE	1,1,1-TCA	Chlorobenzene	Chloroform	1,1 DCA	c-1,2 DCE
HWS	MW - 3	2/6/96	NA	NA	<5.0	<5.0	10	320	1400	<5.0	<5.0	<5.0	<5.0	<5.0
		3/14/96	<.0041	<0.030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		7/8/96	0.0045	<0.030	<50	<50	<50	230	2000	<50	77	<50	<50	<50
		5/19/97	<0.0050	0.027	<1.0	<1.0	<1.0	130	940	<1.0	<1.0	<1.0	<1.0	<1.0
		5/19/1997(D)	<0.0050	0.026	<1.0	<1.0	<1.0	150	980	<1.0	<1.0	<1.0	<1.0	<1.0
	MW - 14D	5/19/97	<0.0050	<0.0050	<50	<50	<50	170	1200	<50	<50	<50	<50	<50
	MW - 15C	5/19/97	0.0062	0.055	<1.0	<1.0	<1.0	18	14	<1.0	<1.0	<1.0	<1.0	<1.0
MC	MW - 16C	5/19/97	<0.0050	0.0086	<50	120	<50	70	1800	270	<50	<50	<50	1.3
	MW - 4	2/6/96	NA	NA	18	6.9	<5.0	<5.0	75	8.6	<5.0	<5.0	<5.0	<5.0
		3/14/96	<.0040	<0.030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		7/8/96	<.0040	<0.030	41	17	<5.0	<5.0	84	12	<5.0	<5.0	<5.0	<5.0
		5/16/97	0.005	0.013	39	9.8	<1.0	3.4	76	10	<1.0	1.3	1.1	<1.0
Field/Equipment Blank		5/19/97	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip Blank		5/19/97	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
NC 2L Standard			0.015	0.05	2100	7.0	70	2.8	0.7	200	50	1.0	1.0	1.0

Acronyms

Acronyms

1,1 DCA - 1,1-Dichloroethane
 1,1 DCE - 1,1-Dichloroethene
 1,1,1 - TCA - 1,1,1-Trichloroethane
 ACA - Air Compressor Area
 c-1,2-DCE - cis-1,2-Dichloroethene
 DG - Downgradient

FSS - Former Fairchild Storage Shed
 HWS - Hazardous Waste Storage Area
 MC - Methylene Chloride Storage Area
 NA - Not Applicable
 PCE - Tetrachloroethene
 t-1,2-DCE - trans-1,2-Dichloroethene
 TCE - Trichloroethene
 TCFM - Trichlorofluoromethane

Notes:

1. Samples collected in 1996 were analyzed by GTEL Environmental Laboratories in Tampa, Florida and Wichita, Kansas.
2. Samples collected in 1997 were analyzed by VOC Analytical Laboratories, Inc.
3. NC 2L - North Carolina Title 15 A Subchapter 2L Groundwater Quality Standards.
4. DATE (D) - is a duplicate sample collected on that date
5. Metals (EPA 6010/3030C for Chromium and EPA 7421/3030C for Lead)
5. Purgeable Halocarbons (EPA 8260/601)

RECEIVED
N.C. DEPT. OF ENVIRONMENTAL
MAR - 9 2000
Winston-Salem
Regional Office

**COMPREHENSIVE SITE ASSESSMENT
AND PROPOSED CORRECTIVE ACTION PLAN
SUN CHEMICAL FACILITY
1100 FAIRCHILD ROAD
WINSTON-SALEM, NORTH CAROLINA**

Prepared for:

*Sun Chemical Corporation
135 West Lake Street
Northlake, Illinois 60164*

Prepared by:

*Resolve Environmental Services, P.A.
410 East Franklin Street
Monroe, North Carolina 28112*

February 28, 2000

To receive a "no further action" designation from the IHWSB, all release incidents recorded at the facility are required to be investigated per IHSWB protocol.

Following a review of the August 30, 1996 report, Ms. Jesneck contacted Resolve and stated that if the investigative and necessary remedial activities were not completed by December 1996, the IHWSB intended to place a hazardous waste site designation on the deed to the Fairchild Road property.

To avoid deed recordation, the transfer of the regulatory lead of this project from the IHWSB to the Winston-Salem Regional Office of the DENR was negotiated. As part of the negotiations, Sun Chemical began removing the 17 USTs located at the facility in October 1996. The regulatory lead transfer was formalized when the Winston-Salem Regional Office forwarded a NOV to Sun Chemical on November 5, 1996.

This NOV requested that Sun Chemical submit a comprehensive site assessment to the DENR that adequately describes the vertical and horizontal extent of affected soil and groundwater previously detected at the Fairchild Road facility.

2.5 Work Conducted for the Winston-Salem Regional Office of the DENR

2.5.1 Closure of the Tanks Located in the Two Small On-site Basins

On October 15 and 16, 1996, a total of six USTs located in the two small basins at the site were permanently closed through excavation and off-site disposal. A tank closure report was forwarded to the DENR on January 10, 1997. The layout of the facility, including the location of the two small basins that contained the six USTs (Tank nos. 1, 2, 3, and 10 and Tank nos. 4 and 5) closed during the investigation, is presented in Figure 2.

One groundwater sample was collected from each basin and one composite soil sample was collected from the soil removed from each basin. Hydrologic, Inc. of Frankfort, Kentucky analyzed the stockpile soil and groundwater samples by SW-846 Method 8240 and Method 8270. In 1996, the DENR required that a pit water sample be collected in lieu of soil samples when the base of tanks extended below the groundwater table.

Pit water sample TE-1 contained acetone (1,600 micrograms per liter ($\mu\text{g/l}$)), 2-butanone (5,380 $\mu\text{g/l}$), 1,1-dichloroethane (30.4 $\mu\text{g/l}$), 1,1-dichloroethene (17.0 $\mu\text{g/l}$), toluene (9.70 $\mu\text{g/l}$), 1,1,1-trichloroethane (37.3 $\mu\text{g/l}$), trichloroethylene (5.63 $\mu\text{g/l}$), vinyl chloride (18.2 $\mu\text{g/l}$), and bis (2-ethylhexyl) phthalate (1,650

from monitor wells W-1, FC-1 and FC-2 were analyzed for the presence of common industrial solvent compounds by EPA Method 601.

The locations of the sampled monitor wells and the associated analytical results are presented in Figure 14. A plan view of north-south (A-A') and east-west (B-B') cross-sections is illustrated in Figure 15. The associated hydrogeologic cross-sections are presented in Figure 16.

Solvent compounds, including 1,1-dichloroethene, 1,1-dichloroethane, tetrachloroethene, 1,1,1-trichloroethane and trichloroethene were detected in the groundwater samples collected from monitor well MW-12 and the off-site monitor wells W-1, FC-1 and FC-2. A similar suite of solvent compounds was detected in groundwater samples collected as part of investigations conducted by Wachovia Oil Company and Burns Aerospace. These facilities are located to the west and east of the Mountcastle property, respectively.

Historical groundwater analytical data and monitor well locations for the investigations conducted at the Wachovia Oil and Burns Aerospace facilities are summarized in the figures and tables presented in Appendix G. This information was acquired from files reviews conducted at the Winston-Salem Regional Office of the DENR.

These groundwater quality data in conjunction with shallow groundwater flow data indicate that the chlorinated solvent compounds detected in groundwater samples collected from monitor wells completed on the Sun Chemical property emanate from an off-site source.

2.5.7 Closure of 11 Tanks Located in Large Tank Basin

On May 10 and 11, 1998, the 11 USTs located in the large tank basin were permanently closed through excavation and off-site disposal. Groundwater was encountered beneath each of the 11 tanks. Volume I of the January 2, 1998 *Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater for Sources Other Than Petroleum Underground Storage Tank*, which states "upon encountering groundwater in an excavation, it is best not to grab a water sample." Monitor wells MW-2 and MW-3 are located immediately downgradient and upgradient of this basin, respectively. Accordingly a pit water sample was not collected at the time of closure.

Approximately 63 tons of toluene-affected soil were removed from the pump station area and transferred directly into trucks for off-site treatment at the

3.0 CORRECTIVE ACTION

3.1 Soil

Affected soil detected in the vicinity of Area 6 was excavated and appropriately disposed off-site to the satisfaction of the IHWSB in 1995.

Affected soil detected in the vicinity of the three on-site UST basins was excavated and appropriately disposed off-site in 1997 and 1998. The DENR was informed of these remedial activities prior to implementation and observed the excavation of the affected soil from the large tank basin.

Based on the available analytical data, additional remediation of soil at the site is not warranted.

3.2 Groundwater

On November 4, 1997, an eight-hour enhanced fluid/vapor recovery event was conducted at monitor wells MW-4 and MW-5 (approximately four hours per well). The approximately 912 gallons of affected groundwater generated during this recovery event was disposed at the HOH Corporation facility located in Winston-Salem.

Groundwater samples collected from these two monitor wells immediately prior to conducting the recovery events and following the recovery events were analyzed for the presence of toluene by EPA Method 602.

Analytical data indicate that the toluene concentrations detected in the groundwater samples collected from monitor wells MW-4 and MW-5 prior to and following the recovery events were reduced from 150,000 $\mu\text{g/l}$ to 11,000 $\mu\text{g/l}$ and from 280,000 $\mu\text{g/l}$ to 110,000 $\mu\text{g/l}$, respectively.

Additional groundwater samples were collected from monitor wells MW-4 and MW-5 on December 16, 1997 and analyzed by EPA Method 602. Toluene was detected in these samples at concentrations of 73,000 $\mu\text{g/l}$ and 200,000 $\mu\text{g/l}$, respectively.

On April 1, 1998, another eight hour recovery event was conducted on monitor wells MW-4 and MW-5. The approximately 822 gallons of affected groundwater generated as part of this recovery event were also disposed at the HOH Corporation facility.

4.0 CONCLUSIONS AND PROPOSED GROUNDWATER CORRECTIVE ACTION

In a November 5, 1996 NOV, Sun Chemical was directed by the DENR to characterize the cause, significance and extent of affected soil and groundwater detected at this facility so that an appropriate corrective action plan may be developed.

4.1 Extent of Contamination Defined

As discussed in Section 2 of this report, environmental conditions at the facility have been thoroughly defined.

Affected soil identified by the IHWSB and in the vicinity of the three former on-site tank basins has been excavated and disposed off-site.

Groundwater analytical data indicate that the vertical and horizontal extent of toluene-affected groundwater is defined. Toluene was detected in groundwater samples collected from shallow monitor wells MW-2, MW-4 and MW-5, which extend to depths less than 18 feet below the ground surface along the eastern end of the main facility.

Toluene was not detected in groundwater samples collected from shallow monitor wells MW-1, MW-3, MW-6, and MW-9, which also extend to depths less than 18 feet below the ground surface and are located upgradient and downgradient of the affected area. Toluene was not detected in the groundwater samples collected from monitor well MW-8, which is screened over the 35-foot to 40-foot depth interval directly downgradient of monitor wells MW-4 and MW-5.

The "Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater, Volume I Sources Other than Petroleum Underground Storage Tanks" issued by the DENR in May, 1998 indicates that affected groundwater is to be remediated to the North Carolina Administrative Code (NCAC) 2L .0202 standards. Accordingly, remediation of the toluene impacted groundwater will be required.

Groundwater quality and flow data indicate the chlorinated solvents detected in groundwater samples collected from monitor wells located on the Sun Chemical property are emanating from an off-site and upgradient source. The selected groundwater treatment alternative, therefore, does not address chlorinated solvent compounds.

4.2 Proposed Groundwater Corrective Action Alternative

In anticipation of conducting groundwater remedial activities, Sun Chemical evaluated the potential for enhanced fluid/vapor recovery to be a feasible treatment alternative for the toluene-affected groundwater detected at the site.

Analytical data indicate enhanced fluid/vapor recovery has effectively reduced the toluene concentration in the plume of affected groundwater that apparently emanates from the south side of the large tank basin. Sun Chemical, therefore, proposes to resume enhanced fluid/vapor recovery at monitor wells MW-2, MW-4 and MW-5.

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TABLE 1
UST Data Summary
Sun Chemical Specialty Inks
1100 Fairchild Road
Winston-Salem, North Carolina

TANK NO.	DATE INSTALLED	VOLUME (GAL.)	PRODUCT STORED
1	1965	5,000	Acetone
2	1965	5,000	Closed in-place 1992
3	1965	5,000	DBP
4	January 1975	4,000	NP Acetate
5	January 1975	4,000	MEK
6	January 1983	10,000	Empty (Formerly Toluene)
7	January 1983	10,000	Empty
8	January 1983	10,000	Ecusta (80IPA/20TOL)
9	January 1983	10,000	IPA
10	June 1983	2,000	Washup
11	September 1983	4,000	SJX-7400
12	September 1983	2,000	SJC-6609
13	September 1983	2,000	SJC-7398
14	September 1983	2,000	SJC-7399
15	September 1983	2,000	Ethyl Acetate 99%
16	September 1983	2,000	Ethyl Alcohol 95%
17	September 1983	2,000	Isopropyl Alcohol
18	Unknown	4,000	Heating Oil clean closure by ERM 1992

DBP = Dibutyl phthalate
MEK = Methyl ethyl ketone
SJX-7400 = 32% IPA, 8% toluene
SJC-7398 = 52% IPA, 13% toluene

NP Acetone = Normal propyl acetate
IPA = Isopropyl acetate
SJC-6609 = 49% IPA, 12% toluene
SJC-7399 = 59% IPA, 15% toluene

TABLE 6
Groundwater Analytical Data Results
Sun Chemical Specialty Inks
1100 Fairchild Road
Winston-Salem, North Carolina

Well I.D.	Method 8240 Compounds ($\mu\text{g/l}$)											Method 8270 Compounds ($\mu\text{g/l}$)
	CD	EB	T	X	TCE	PCE	2-Hex	1,1-DCE	1,1-DCA	1,2-DCA	1,1,1-TCA	All Compounds
MW-1	6.24	--	--	--	--	--	--	--	--	--	--	--
MW-2	16.5	23.9	13100	18.7	--	--	301	--	--	--	--	--
MW-3	--	--	--	--	--	6.27	--	3.69	--	--	17.7	--
MW-4	--	--	97000	--	--	--	--	--	--	--	--	--
MW-5	--	--	319000	--	--	--	--	--	--	--	--	--
MW-6	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	--	--	--	--	12.1	27.7	--	42.8	5.77	18.2	115	--
MW-9	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	13.9	--	--	--	--	--	--	--	--	--	--	--
MW-11	--	--	--	--	29.8	68.6	--	48.1	17.7	29.8	200	--
AC2L	700	29	1000	530	2.8	0.7	NS	7.0	700	0.38	200	--

Groundwater samples collected by Resolve personnel on February 17 and 18, 1997. Samples analyzed by SW-846 Method 8240 and Method 8270 at Hydrologic, Inc. of Frankfort, Kentucky.

Results presented in micrograms per liter ($\mu\text{g/l}$).

-- = Below Detection Limit

NCAC2L = North Carolina groundwater standard

NS = No standard

CD = carbon disulfide; EB = ethylbenzene; T = toluene; X = xylenes; TCE = trichloroethylene; PCE = tetrachloroethylene

2-Hex = 2-hexanone; 1,1-DCE = 1,1-dichloroethene; 1,1-DCA = 1,1-dichloroethane; 1,2-DCA = 1,2-dichloroethane;

1,1,1-TCA = 1,1,1-trichloroethane

TABLE 2
Historical Groundwater Analytical Data
Sun Chemical Specialty Inks
1100 Fairchild Road
Winston-Salem, North Carolina

Well I.D.	Date	Targeted SW-846 Method 8240 Compounds ($\mu\text{g/l}$)				
		Toluene	Ethyl Alcohol	Isopropyl Alcohol	Ethyl Acetate	Isopropyl Acetate
MW-1	4-26-93	510	BDL	BDL	BDL	BDL
	10-19-95	BDL	BDL	BDL	BDL	BDL
	8-8-96	BDL	BDL	BDL	BDL	BDL
MW-2	4-26-93	121,500	BDL	BDL	BDL	BDL
	10-19-95	84,000	BDL	BDL	BDL	BDL
	8-8-96	14,000	BDL	BDL	BDL	BDL
MW-3	4-26-93	BDL	BDL	BDL	BDL	BDL
	10-19-95	BDL	BDL	BDL	BDL	BDL
	8-8-96	BDL	BDL	BDL	BDL	BDL
MW-4	4-26-93	72,900	BDL	BDL	BDL	BDL
	10-19-95	210,000	BDL	BDL	BDL	BDL
	8-8-96	330,000	BDL	BDL	BDL	BDL
MW-5	4-26-93	132,000	BDL	225,000	36,800	52,700
	10-19-95	200,000	BDL	BDL	BDL	BDL
	8-8-96	300,000	BDL	BDL	BDL	BDL
MW-6	4-26-93	BDL	BDL	BDL	BDL	BDL
	10-19-95	66	BDL	BDL	BDL	BDL
	8-8-96	BDL	BDL	BDL	BDL	BDL
MW-7	4-26-93	BDL	BDL	BDL	BDL	BDL
	10-19-95	BDL	BDL	BDL	BDL	BDL
	8-8-96	BDL	BDL	BDL	BDL	BDL
MW-8	10-19-95	BDL	BDL	BDL	BDL	BDL
	8-8-96	BDL	BDL	BDL	BDL	BDL
MW-9	10-19-95	32	BDL	BDL	BDL	BDL
	8-8-96	BDL	BDL	BDL	BDL	BDL
MW-10	10-19-95	BDL	BDL	BDL	BDL	BDL
	8-8-96	BDL	BDL	BDL	BDL	BDL
MW-11	10-19-95	BDL	BDL	BDL	BDL	BDL
	8-8-96	BDL	BDL	BDL	BDL	BDL

Notes: 4-26-93 sampling event conducted by Turner Environmental. Samples analyzed by Hydrologic of Frankfort, Kentucky.
10-19-95 and 8-8-96 sampling events conducted by Resolve. Samples analyzed by IEA of Cary, North Carolina.
Results presented in micrograms per liter ($\mu\text{g/l}$).
BDL = Below Detection Limit